# Guidebook to Water Management

## Background Information on Organizations, Policies, Legislation, Programs, and Projects in the Bow River Basin

Prepared for:
The Bow Basin Plan
A Water Management Strategy for the Future of the Bow River Basin

March 2002

Alberta Environment

Bow River Council

## Caveat and Limitations

This document summarizes a wide variety of complex policies, legal arrangements, practices, and procedures. Although care was taken to provide accurate and up-to-date information, the material contained in this document should only be used for general guidance. Prior to engaging in an activity that could affect the use or management of water, a person should consult the original documents (e.g., policy, law), the relevant government agency or other organization, and appropriate experts (e.g., lawyers, engineers).

### Questions or Comments about the *Guidebook*

Please contact:

Bow River Basin Council
300, Atrium VII, 340 Midpark Way SE
Calgary, AB
T2X 1P1

E-mail: shamza@earthtech.ca

Tel: (403) 254-3419
Fax: (403) 254-3333
Internet: www.brbc.ab.ca

For copies of this report, contact:

Information Centre
Alberta Environment
Main floor, Great West Life Bldg.
9920-108 Street
Edmonton, Alberta
T5K 2M4

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# A. Introduction

## A.1 A Key Ingredient in Working Together

Participants in the Bow Basin Plan[1] (see section G.9) recognize that people need to work together to improve management of the waters of the basin. Reliable and commonly understood information is a key ingredient in meeting that goal.

The *Guidebook to Water Management* is an inventory of the organizations, policies, laws, other legal arrangements, programs, and projects that influence water management in the basin. The *Guidebook* can be used as a source of information on who's who in water management and the rules governing how water is used and protected.

The term *water management* includes a variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge, and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

## A.2 A Partnership

The *Guidebook* was prepared through a partnership among governments, water users, and stakeholder organizations, under the direction of the Steering Committee for the Bow Basin Plan.

The Bow River Basin Council has supported development of the *Guidebook* since it will help Albertans protect water and improve water use management in the basin.

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[1] The Bow Basin Plan will provide better information, improved analytical tools, and timely recommendations for decisions related to water in the Bow River Basin. The Plan's emphasis is on establishing instream objectives and providing input into the planning for the South Saskatchewan River Basin.

## A.3 Limitations

There has been extensive review and consultation conducted in preparation of the *Guidebook*. As you use the *Guidebook*, though, you need to keep in mind that it is a description. It does not evaluate the strengths and weaknesses of policies, laws, etc. nor does it identify overlaps, gaps, incompatibilities, or conflicts among them.

The *Guidebook* is also a summary. Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. It is your responsibility to evaluate the information contained in the *Guidebook* and to consult the appropriate experts and the original documents before taking action. Regarding laws, regulations, and other legal arrangements, the actual documents should be reviewed in consultation with legal counsel.

## A.4 Meeting the Needs of the Basin

The Bow River Basin (see Map A.1) is a diverse and dynamic region of Alberta. It includes the mountain wilderness of Banff National Park and Kananaskis Country, the varied landscapes of the foothills, the semi-arid prairies, and intensively developed urban areas such as Calgary, Canmore, High River, and Brooks.

Ecosystems in the basin provide habitat for both native and introduced species of fish, wildlife, and vegetation. Some parts of the basin, such as the Bow River Valley in Banff National Park and the rainbow trout fishery downstream of Calgary, are world-renowned for their recreational value.

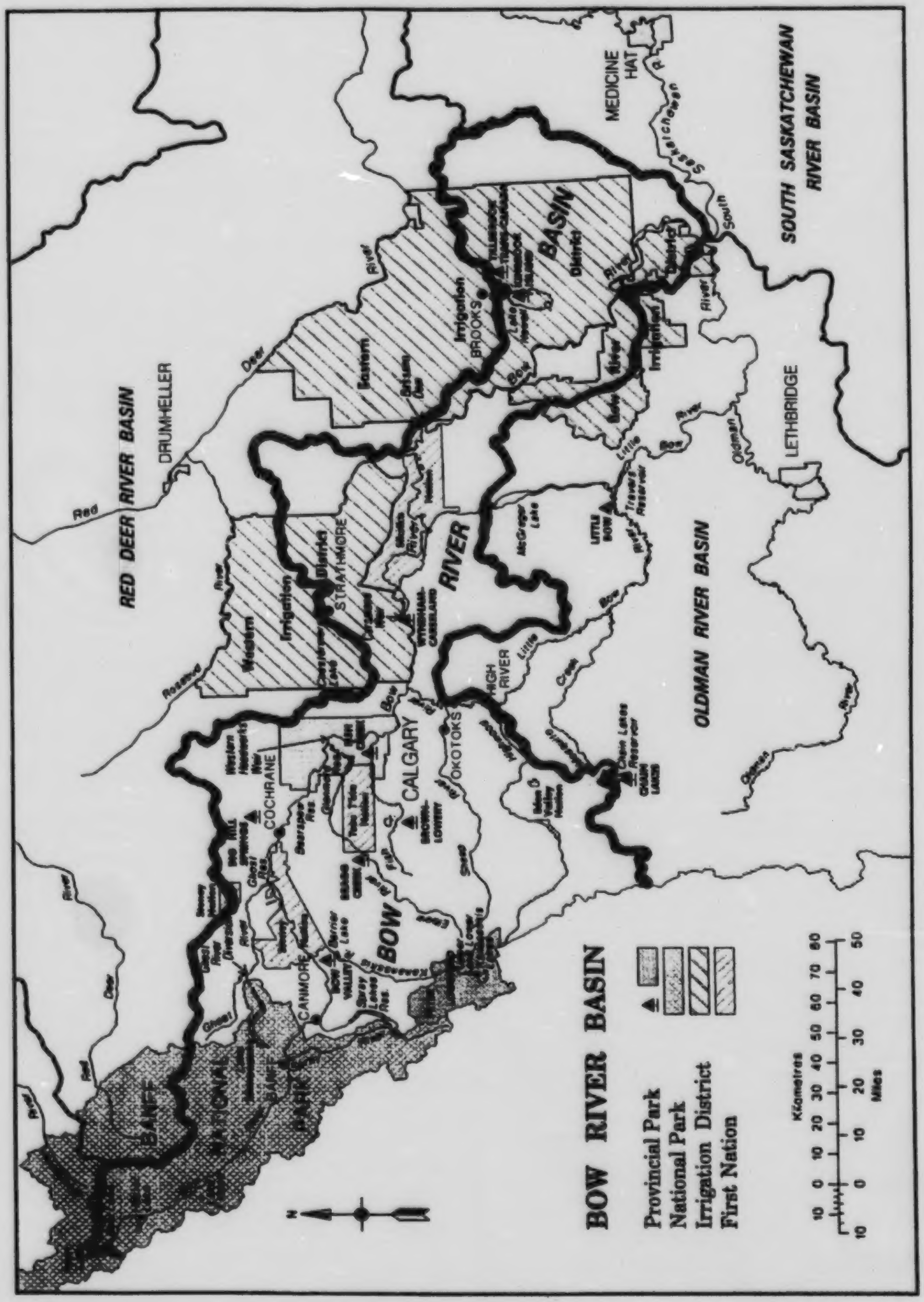
Over 1,000,000 people live in the Bow River Basin and another 12,000 people rely on water diverted from the basin. Population and economic development are increasing.

The Bow River, its tributaries, and ground water provide water for:

- domestic use
- industrial use
- effluent discharge
- municipal use
- hydropower
- recreation
- irrigation
- stockwatering
- ecosystem requirements

There will be a continuing need for an adequate supply of good quality water for ecosystem requirements (such as habitat for animal and plant life), while the demand for good quality water for human uses will continue to grow.

## Map A.1 Bow River Basin


BOW RIVER BASIN
Provincial Park
National Park
Irrigation District
First Nation
Kilometres
Miles
10 0 10 20 30 40 50 60 70 80
10 0 10 20 30 40 50
N
RED DEER RIVER BASIN
DRUMHELLER
Red Deer River
Rosebud
MEDICINE HAT
South Saskatchewan River
SOUTH SASKATCHEWAN RIVER BASIN
OLDMAN RIVER BASIN
LETHBRIDGE
Oldman River
BROOKS
Eastern Irrigation District
Lake Newell
Bow River Irrigation District
BASIN
STRATHMORE
Western Irrigation District
Chestermere Lake
BOW RIVER
CALGARY
COCHRANE
Bearspaw Res.
Ghost Res.
Ghost River
OKOTOKS
HIGH RIVER
Highwood River
Little Bow River
McGregor Lake
Travers Reservoir
LITTLE BOW
Chain Lakes Reservoir
CHAIN LAKES
Sheep
Elbow
Kananaskis
CANMORE
BOW VALLEY
Spray Lakes Res.
BANFF
BANFF NATIONAL PARK

The ability to meet these requirements depends on a complex system of policies, laws, licences, approvals, and physical infrastructure such as dams and wastewater treatment plants. As well, the resources of the basin are protected and their use is managed by a number of jurisdictions, including the provincial government, Banff National Park (federal government), municipalities, First Nations, and irrigation districts.

The Bow River is part of the Saskatchewan River Basin that Alberta shares with Saskatchewan and Manitoba. The Bow River is a tributary of the South Saskatchewan River. The use of water from the South Saskatchewan River Basin is governed by the *Master Agreement on Apportionment*, which, in general, requires half the natural flow to be passed to Saskatchewan each year and sets objectives for water quality. Because of our commitments to Saskatchewan, water from the Bow River must be managed in concert with other parts of the South Saskatchewan Basin.

## A.5 Who Can Benefit from the Guidebook

Water issues are complex. It is seldom easy for a person to understand and feel comfortable discussing all aspects of a water issue. The *Guidebook* will reduce these problems by increasing people's knowledge of arrangements such as laws and policies and how they influence the quantity and quality of water.

The *Guidebook* has been written for professionals, technicians, decision-makers, and others who are involved in water issues. To benefit from the *Guidebook*, a person does not need to be an expert on a particular topic nor do they need to be involved directly in water use and management.

## A.6 How to Use the Guidebook

The *Guidebook* should be used like an encyclopedia or dictionary. Read it when you need an answer to a question or when you want a clearer idea of how a law, policy, etc. works.

The *Guidebook* is divided into several major sections:

- **Section B:** **organizations** actively involved in one or more aspects of water use management
- **Section C:** **jurisdictional responsibilities**, the division of power between the provincial and federal governments
- **Section D:** **policies, principles, and objectives** that provide the direction for water use management

- **Section E:** **laws and regulations** that facilitate and regulate the use and management of water
- **Section F:** **treaties, agreements, and other legal arrangements** that have an influence over water use management
- **Section G:** **programs and projects**, the nuts and bolts of water use management
- **Section H:** **best management practices**, the "state-of-the-art" in water use management in Alberta.

A series of tables and figures provide summaries of key information. The tables and figures that will be of the greatest benefit are:

- **Table A.1** - provides an **overview** of laws, policies, etc. indexed to the location of the material in the *Guidebook*
- **Figure B.1** – summarizes **organizations** and their roles, and authority to issue approvals
- **Figure E.1** – summarizes the key pieces of **legislation**.

There is also a glossary (including acronyms) for deciphering unfamiliar terms and an extensive index for finding topics of interest.

## A.7 Acknowledgements

The *Guidebook* was proposed by the Legal/Institutional Sub-Committee that helped design the planning process for the Bow Basin. Following confirmation from the public that a guidebook would be useful, a working group coordinated preparation of the *Guidebook*. The members of those committees provided excellent advice and quality control as the *Guidebook* was developed. A wide variety of people provided material for the *Guidebook* and reviewed drafts. Thanks to them for their advice and commitment of time. All concerned have made the *Guidebook* a valuable source of information. Special thanks to Danielle Ancelet and Andrea Czarnecki for formatting and editing the *Guidebook* and making sure a long-running project was successfully completed.

| **Legal/Institutional Sub-Committee**<br>Design Phase (1993-1994) | | **Guidebook Working Group**<br>(Includes past members) | |
|---|---|---|---|
| **Alf Birch** | Executive Director, Alberta Water Resources Commission | **Hector Beaudet** | Alberta Environment (AENV) |
| **Chris Campbell** | Executive Director, Bow River Water Quality Council | **Kent Berg** | AENV |
| **Lew Fahner** | Controller of Water Resources, Alberta Environmental Protection (AEP) | **Chris Campbell** | Business Manager, Bow River Basin Water Council (BRBWC) |
| **Dick Hart** | Planning Division, AEP | **Saba Gnanakumar** | AENV |
| **Ed Hildebrand** | Western Irrigation District | **Menno Homan** | Member, BRBWC |
| **Kit Lewis** | Springbank Residents and Landowners Association | **Bob Morrison** | AENV |
| **Bob Morrison** | Planning Division, AEP | **Al Taylor** | Member for the Calgary Area Outdoor Council on the BRBWC |
| **David Spink** | Director, Air and Water Approvals Division, AEP | | |

## Table A.1 Guide to Key Laws and Other Institutional Arrangements

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Bed and shores of water bodies [Also see "Forested Land (Green Area)"] | *Public Lands Act*<br>(Section E.3.7) | • The *Public Lands Act* regulates the administration, allocation, and management of public land resources in Alberta. | • Public Lands Division, ASRD | • A permit is required for most activities that would affect the bed and shores of a water body<br>• Shoreland Management Program<br>• Enforcement<br>• Riparian land use practices |
| | *Water Act*<br>(Section E.3.8) | • The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | • RS, AENV | • An approval is required before alterations are made to a water body<br>• Enforcement<br>• Fisheries habitat protection practices<br>• Instream construction practices<br>• Stormwater management |
| | *Municipal Government Act* (MGA)<br>(Section E.3.5) | • The MGA establishes the powers of municipalities in Alberta.<br>• The MGA defines the limits of municipal authority and is subject to other provincial legislation including the *Public Lands Act* and the *Water Act*. | • Municipality | • Municipal bylaws<br>• Municipal plans<br>• Land use guidelines |
| Conflicts between farmers and non-farmers | *Agricultural Operation Practices Act*<br>(Section E.3.1) | • The *Agricultural Operation Practices Act* provides the framework for resolving conflicts between farmers and non-farmers in Alberta. | • AAFRD | • Feedlot management practices<br>• Land use guidelines<br>• Pesticide application practices |
| Contaminated sites | *Environmental Protection and Enhancement Act (EPEA)*<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • Management of contaminated sites<br>• Enforcement<br>• Management of petroleum storage tanks |
| | *Canadian Environmental Protection Act (CEPA)*<br>(Section E.2.3) | • CEPA governs a variety of environmental issues such as federal-provincial cooperation and control of toxic substances. | • EC<br>• CCME | • Toxic substances are regulated through regulations and lists of priority, toxic, hazardous, and prohibited substances<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances* |
| Education | | | • AENV | • Environmental Education Program<br>• Information Centre<br>• Environmental education practices (Section H.7) |

AAFRD = Alberta Agriculture, Food and Rural Development (Section B.6.2)
ASRD = Alberta Sustainable Resource Development (Section B.6.5)
AENV = Alberta Environment (Section B.6.4)
BRBC = Bow River Basin Council (Section B.5.5)
CCME = Canadian Council of Ministers of the Environment
CHR = Calgary Health Region (Section B.6.6)
EC = Environment Canada
EA = Environmental Assurance
DFO = Department of Fisheries and Oceans (Section B.3.2)
LFD = Land and Forest Division
NRCB = Natural Resources Conservation Board
PPWB = Prairie Provinces Water Board (Section F.4.2)
RS = Regional Services
SDCC = Sustainable Development Coordinating Council
TUC = Trout Unlimited Canada (Section B.5.13)

### Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Environmental assessment | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | - EPEA provides the regulatory framework for environmental protection in Alberta. | - EA, AENV<br>- NRCB | - For some projects, an environmental impact assessment is mandatory<br>- *Canada-Alberta Agreement for Environmental Assessment Cooperation*<br>- Environmental assessment practices |
|  | *Canadian Environmental Assessment Act* (CEAA)<br>(Section E.2.2) | - CEAA makes environmental assessment an integral part of federal government decisions.<br>- The federal government conducts environmental assessments when a federal agency is a participant in or regulator of a project. | - Canadian Environmental Assessment Agency | - *Canada-Alberta Agreement for Environmental Assessment Cooperation*<br>- Environmental assessment practices |
| Fish and fish habitat | *Fisheries Act*<br>(Section E.2.4) | - The *Fisheries Act* provides regulation and protection of fisheries. | - DFO<br>- Fish and Wildlife, ASRD | - An authorization may be required when a project will result in destruction of fish habitat<br>- Regulations govern the deposit of substances deleterious to fish<br>- Enforcement<br>- Fisheries habitat protection practices<br>- Instream needs determination |
| Forested land (Green Area) [Also see "Bed and shores..." and "Public lands in White Area"] | *Forests Act*<br>(Section E.3.3) | - The *Forests Act* provides jurisdiction, control, and administration over all matters in any way connected with timber on Crown land in Alberta. | - LFD, ASRD | - Land use guidelines<br>- Riparian land use practices |
|  | *Public Lands Act*<br>(Section E.3.7) | - The *Public Lands Act* regulates the administration, allocation, and management of public land resources in Alberta. | - Public Lands Division, ASRD | - A permit is required for most activities that would affect a water body<br>- Shoreland Management Program<br>- Land use guidelines<br>- Riparian land use practices<br>- Enforcement |

AAFRD = Alberta Agriculture, Food and Rural Development (Section B.6.2)
ASRD = Alberta Sustainable Resource Development (Section B.6.5)
AENV = Alberta Environment (Section B.6.4)
BRBC = Bow River Basin Council (Section B.5.5)
CCME = Canadian Council of Ministers of the Environment
CHR = Calgary Health Region (Section B.6.6)
EC = Environment Canada
EA = Environmental Assurance
DFO = Department of Fisheries and Oceans (Section B.3.2)
LFD = Land and Forest Division
NRCB = Natural Resources Conservation Board
PPWB = Prairie Provinces Water Board (Section F.4.2)
RS = Regional Services
SDCC = Sustainable Development Coordinating Council
TUC = Trout Unlimited Canada (Section B.5.13)

## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Hazard reduction | | | • RS, AENV | • Alberta Water Management and Erosion Control Program (Section G.3)<br>• Canada-Alberta Flood Damage Reduction Program (Section G.12)<br>• Dam safety management practices (Section H.2)<br>• Erosion control practices (Section H.8)<br>• Flood damage management practices (Section H.11) |
| | | | • Royal Sun Insurance | • Alberta Cloud Seeding Project (Section G.1) |
| Hazardous wastes | *Canadian Environmental Protection Act* (CEPA)<br>(Section E.2.3) | • The *Canadian Environmental Protection Act* governs a variety of environmental issues such as federal-provincial cooperation and control of toxic substances. | • EC<br>• CCME | • Toxic substances are regulated through regulations and lists of priority, toxic, hazardous, and prohibited substances<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances* |
| | *Environmental Protection and Enhancement Act (EPEA)*<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • Hazardous materials within Alberta are tracked from "cradle to grave" through a manifest system specified in the Act and regulations<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances*<br>• Enforcement<br>• Hazardous wastes management practices<br>• Landfill management practices<br>• Waste management practices |
| Irrigation districts | *Irrigation Districts Act*<br>(Section E.3.4) | • The *Irrigation Districts Act* governs all activities, and operations of irrigation districts in Alberta. | • Irrigation Council<br>• Irrigation districts<br>• AAFRD | • Irrigation district bylaws<br>• Licences for irrigation districts and provincial projects that supply water to irrigation districts<br>• Water use management policies and programs of irrigation districts<br>• Irrigation Rehabilitation Program |
| | | | • Alberta Irrigation Projects Association | • Assists its member districts to expand irrigation networks |
| Land Reclamation | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • An approval is required for designated industrial activities to ensure that land is properly reclaimed<br>• Enforcement<br>• Land reclamation practices |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Navigation | *Navigable Waters Protection Act*<br>(Section E.2.5) | - The *Navigable Waters Protection Act* protects the navigability of rivers and lakes. | - DFO | |
| Obstructions | *Public Lands Act*<br>(Section E.3.7) | - The *Public Lands Act* regulates the administration, allocation, and management of public land resources in Alberta. | - Public Lands Division, ASRD | - A permit is required for most activities that would affect the bed and shores of a water body<br>- Shoreland Management Program<br>- Enforcement |
| | *Water Act*<br>(Section E.3.8) | - The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | - RS, AENV | - A licence and/or approval is required before an obstruction is placed in a stream or alterations are made to the bed or shores of a water body<br>- Enforcement |
| | *Fisheries Act*<br>(Section E.2.4) | - The *Fisheries Act* provides regulation and protection of fisheries. | - DFO<br>- Fish and Wildlife, ASRD | - An authorization may be required for an obstruction such as a dam<br>- A fish way or compensation may be required<br>- Enforcement |
| | *Navigable Waters Protection Act*<br>(Section E.2.5) | - The *Navigable Waters Protection Act* protects the navigability of rivers and lakes. | - DFO | - Enforcement |
| Phosphorus and other nutrients in detergents | *Canadian Environmental Protection Act*<br>(Section E.2.3) | - The *Canadian Environmental Protection Act* governs a variety of environmental issues such as regulation of nutrients in cleaning agents. | - EC<br>- CCME | - Regulations set the maximum concentration of nutrients in cleaning agents<br>- Enforcement |
| Pollution | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | - EPEA provides the regulatory framework for environmental protection in Alberta. | - EA, AENV | - An approval is required before wastewater can be discharged into a water body<br>- *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances*<br>- Enforcement<br>- Guidelines<br>- Instream needs determination<br>- Pesticide application practices<br>- Standards<br>- Stormwater management<br>- Waste management practices |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Pollution (continued) | *Canadian Environmental Protection Act*<br>(Section E.2.3) | • The *Canadian Environmental Protection Act* governs a variety of environmental issues such as federal-provincial cooperation, environmental quality objectives, guidelines, codes of practice, control of toxic substances, and regulation of nutrients in cleaning agents. | • EC<br>• CCME | • Toxic substances are regulated through regulations and lists of priority, toxic, hazardous, and prohibited substances<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances*<br>• *Canadian Water Quality Guidelines* |
| | *Public Health Act* | • The *Public Health Act* is directed towards protecting the health of the public in Alberta and is very broad in application. | • CHR<br>• Alberta Health & Wellness | • Governs location, operation, maintenance, equipping, cleansing, and disinfecting of wells, water fountains, cisterns, and water tanks |
| | *Fisheries Act*<br>(Section E.2.4) | • The *Fisheries Act* provides regulation and protection of fisheries. | • DFO<br>• Fish and Wildlife, ASRD | • Regulations govern the deposit of substances deleterious to fish<br>• Enforcement<br>• Instream needs determination |
| | *Safety Codes Act* (regulations)<br>(Section E.3.6) | • In Alberta, regulations under the Safety Codes Act govern all water and wastewater plumbing within the property line, including septic tank and tile drainage systems. | • Alberta Municipal Affairs | • All installations of septic fields and other subsurface disposal systems require a permit<br>• Septic systems management practices |
| | | • The *Master Agreement on Apportionment* applies to drainage basins shared by the prairie provinces. | • PPWB | • *Master Agreement on Apportionment*<br>• Interprovincial water quality objectives<br>• Forum for resolving issues among the prairie provinces |
| | | | • BRBC | • Forum for information sharing and discussion<br>• State of the river report<br>• Survey of urban water use management<br>• Joint stakeholder projects |
| | | | • EA, AENV | • Surface Water Quality Monitoring and Assessment Program (Section G.26) |
| | | | • AAFRD<br>• Livestock Expansion and Development Team | • Alberta Environmentally Sustainable Agriculture (AESA) Program (Section G.2)<br>• Crowfoot Creek Watershed Water Quality Study (Section G.16)<br>• Feedlot management practices (Section H.9) |
| | | | • TUC | • Yellow Fish Road™ Program (Section G.30) |

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EA = Environmental Assurance

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### Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Potable water supplies | *Water Act*<br>(Section E.3.8) | • The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | • RS, AENV | • Except for domestic use, in some situations a licence is required before water is diverted from an aquifer or other water body<br>• Enforcement |
| | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA regulates the treatment of water for drinking water and other household purposes. | • EA, AENV | • An approval may be required if water will be supplied to others for drinking water and other domestic purposes<br>• A certificate of qualification is required for an operator of a municipal water treatment plant<br>• Enforcement |
| | *Public Health Act* | • The *Public Health Act* is directed towards protecting the health of the public in Alberta and is very broad in application. | • CHR<br>• Alberta Health & Wellness | • Governs the location, operation, maintenance, equipping, cleansing, disinfecting, and disinfestation of wells, water fountains, cisterns, and water tanks |
| Public land in White Area | *Public Lands Act*<br>(Section E.3.7) | • The *Public Lands Act* regulates the administration, allocation, and management of public land resources in Alberta. | • Public Lands Division, ASRD | • A permit is required for most activities that would affect the bed and shores of a water body<br>• Shoreland Management Program<br>• Enforcement<br>• Riparian land use practices |
| | *Municipal Government Act* (MGA)<br>(Section E.3.5) | • The MGA establishes the powers of municipalities in Alberta.<br>• The MGA defines the limits of municipal authority and is subject to other provincial legislation including the *Public Lands Act* and the *Water Act*. | • Municipality | • Municipal bylaws<br>• Municipal plans<br>• Land use guidelines |
| | *Water Act* and *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.8)<br>(Section E.3.2) | | • AENV | • Alberta Water Management and Erosion Control Program<br>• Pesticide application practices |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Recreation and tourism | | | • AENV | • Canadian Heritage Rivers System (Section G.13)<br>• Parks and Protected Areas Program (Section G.22)<br>• Special Places (Section G.25)<br>• Instream needs determination (Section H.19) |
| | | | • Parks Canada | • Banff National Park Management Plan (Section G.7) |
| | | | • TUC<br>• AENV<br>• Various | • Golf course construction/operation practices (Section H.13) |
| Riparian habitat | | | • TUC<br>• AENV<br>• Various | • Bow River Project (Section G.10)<br>• Alberta Water Management and Erosion Control Program (for enhancement of fish and waterfowl habitat) (Section G.3)<br>• Instream needs determination (Section H.19)<br>• Land use guidelines (Section H.22)<br>• Pesticide application practices (Section H.24)<br>• Riparian land use practices (Section H.27) |
| Stormwater management | *Water Act*<br>(Section E.3.8) | • The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | • RS, AENV | • An approval or licence may be required for the impoundment or discharge of stormwater<br>• Enforcement<br>• Guidelines |
| | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • An approval may be required for discharge of stormwater to a water body<br>• Enforcement<br>• Standards<br>• Stormwater management practices |
| | | | • BRBC | • Forum for information sharing and discussion<br>• State of the river report<br>• Survey of urban water use management<br>• Joint stakeholder projects |

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EA = Environmental Assurance
DFO = Department of Fisheries and Oceans (Section B.3.2)
LFD = Land and Forest Division
NRCB = Natural Resources Conservation Board
PPWB = Prairie Provinces Water Board (Section F.4.2)
RS = Regional Services
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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| **Subdivision approvals** | *Municipal Government Act* (MGA)<br>(Section E.3.5) | • The MGA establishes the powers of municipalities in Alberta.<br>• The MGA defines the limits of municipal authority and is subject to other provincial legislation including the *Public Lands Act* and the *Water Act*. | • Municipality | • Municipal bylaws<br>• Municipal plans<br>• Land use guidelines |
| | *Public Lands Act*<br>(Section E.3.7) | • The *Public Lands Act* regulates the administration, allocation, and management of public land resources in Alberta. | • Public Lands Division, ASRD | • A permit is required for most activities that would affect the bed and shores of a water body<br>• Shoreland Management Program<br>• Enforcement<br>• Riparian land use practices |
| | | | • AENV<br>• EC | • Flood Damage Reduction Program may result in restrictions on development in floodplains (Section G.12) |
| **Sustainable development** | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV<br>• SDCC | • Environmental assessment is a key tool for ensuring sustainable development<br>• The SDCC coordinates, reviews and makes recommendations on matters related to sustainable development and protection of the environment<br>• Enforcement<br>• Environmental assessment practices |
| | *Canadian Environmental Assessment Act* (CEAA)<br>(Section E.2.2) | • CEAA makes environmental assessment an integral part of federal government decisions. | • Canadian Environmental Assessment Agency | • *Canada-Alberta Agreement for Environmental Assessment Cooperation*<br>• Environmental assessment practices |
| | | | • AAFRD<br>• Irrigation Council | • Alberta Environmentally Sustainable Agriculture (AESA) Program (Section G.2) |
| | | | • AENV | • Integrated resource management program (Section G.19)<br>• Bow Basin Plan (Section G.8)<br>• Water quality and quantity modeling (Section H.23)<br>• Flood Damage Reduction Program (Section G.12) |

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EC = Environment Canada
EA = Environmental Assurance

DFO = Department of Fisheries and Oceans (Section B.3.2)
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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Sustainable development (continued) | | | • ASRD | • Special Places (Section G.25) |
| | | | • BRBC | • Forum for information sharing and discussion<br>• State of the river report<br>• Survey of urban water use management<br>• Joint stakeholder projects |
| | | | • Parks Canada | • Banff National Park Management Plan (Section G.7) |
| | | | • Various | • *Convention on Biological Diversity* (Section F.1)<br>• North American Waterfowl Management Plan (Section G.21)<br>• Prairie Conservation Action Plan (Section G.23) |
| Timber harvesting | *Forest Act*<br>(Section E.3.3) | • The *Forests Act* provides jurisdiction, control, and administration over all matters in any way connected with timber on Crown land in Alberta. | • LFD, ASRD | • Timber harvesting on public land requires a timber licence or a timber permit [under an approved forest management agreement (FMA)]<br>• Timber harvesting must comply with regulations and planning/operating ground rules (within an FMA)<br>• Enforcement |
| Toxic substances | *Canadian Environmental Protection Act*<br>(Section E.2.3) | • The *Canadian Environmental Protection Act* governs a variety of environmental issues such as federal-provincial cooperation and control of toxic substances. | • EC<br>• CCME | • Toxic substances are regulated through regulations and lists of priority, toxic, hazardous, and prohibited substances<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances*<br>• Enforcement |
| | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances*<br>• Enforcement<br>• Hazardous wastes management practices<br>• Pesticide application practices<br>• Waste management practices |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Wastewater treatment - municipal and industrial | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • An approval is required for construction/operation of wastewater treatment facilities and the discharge of wastewater into a water body<br>• A certificate of qualification is required for an operator of a wastewater treatment plant<br>• Effluent discharge approvals<br>• Municipal and industrial water use management policies and programs<br>• Enforcement<br>• Guidelines<br>• Industrial and commercial pre-treatment of wastewater<br>• Instream needs determination<br>• Standards<br>• Water and wastewater treatment |
| Wastewater treatment - private | *Safety Codes Act*<br>(Section E.3.6) | • In Alberta, regulations under the *Safety Codes Act* govern all water and wastewater plumbing within the property line, including septic tank and tile drainage systems. | • Alberta Municipal Affairs | • All installations of septic fields and other subsurface disposal systems require a permit<br>• Septic systems management practices |
| Water quality | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA provides the regulatory framework for environmental protection in Alberta. | • EA, AENV | • Approvals or registrations are required to ensure proposed activities that coul cause an adverse effect on the environment are reviewed and operated in accordance with regulatory standards<br>• Enforcement<br>• Guidelines<br>• Instream needs determination<br>• Pesticide application practices<br>• Snow disposal management practices<br>• Standards<br>• Stormwater management |
|  | *Canada Water Act*<br>(Section E.2.1) | • The *Canada Water Act* provides a framework for managing water resources and coordinating activities of various jurisdictions. | • EC | • If required, water quality management areas can be established to provide additional power to regulate pollution |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Water quality (continued) | *Canadian Environmental Protection Act*<br>(Section E.2.3) | • The *Canadian Environmental Protection Act* governs a variety of environmental issues such as federal-provincial cooperation, environmental quality objectives, guidelines, codes of practice, control of toxic substances, and regulation of nutrients in cleaning agents. | • EC<br>• CCME | • Toxic substances are regulated through regulations and lists of priority, toxic, hazardous, and prohibited substances<br>• *Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substance*<br>• *Canadian Water Quality Guidelines*<br>• Enforcement |
| | *Fisheries Act*<br>(Section E.2.4) | • The *Fisheries Act* provides regulation and protection of water quality for fish. | • DFO<br>• Fish and Wildlife, ASRD | • Regulations govern the deposit of substances deleterious to fish<br>• Enforcement<br>• Instream needs determination |
| | *Public Health Act* | • The *Public Health Act* is directed towards protecting the health of the public in Alberta and is very broad in application. | • CHR<br>• Alberta Health & Wellness | • Governs the location, operation, maintenance, equipping, cleansing, disinfecting, and disinfestation of wells, water fountains, cisterns, and water tanks |
| | *Safety Codes Act*<br>(Section E.3.6) | • In Alberta, the regulations under the *Safety Codes Act* govern all water and wastewater plumbing within the property line, including septic tank and tile drainage systems. | • Alberta Municipal Affairs | • All installations of septic fields and other subsurface disposal systems require a permit<br>• Septic systems management practices |
| | Riparian rights<br>(Section F.3) | • Subject to the *Water Act* and the *Environmental Protection and Enhancement Act*.<br>• Governs water use by owners of land adjoining a watercourse. | | |
| | | | • BRBC | • Forum for information sharing and discussion<br>• State of the river report<br>• Survey of urban water use management<br>• Joint stakeholder projects |
| | | | • AAFRD<br>• Livestock Expansion and Development Team | • Alberta Environmentally Sustainable Agriculture (AESA) Program (Section G.2)<br>• Crowfoot Creek Watershed Water Quality Study (Section G.16)<br>• Feedlot management practices (Section H.9)<br>• Riparian land use practices (Section H.27) |
| | | • The *Master Agreement on Apportionment* applies to drainage basins shared by the prairie provinces. (Section F.4.2) | • PPWB | • *Master Agreement on Apportionment*<br>• Interprovincial water quality objectives<br>• Forum for resolving issues among the prairie provinces |
| | | | • TUC | • Yellow Fish Road™ Program (Section G.30) |

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EA = Environmental Assurance

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**Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)**

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Water use | *Water Act*<br>(Section E.3.8) | • The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | • RS, AENV | • Except for household use, in some situations a licence is required before water is diverted from a water body<br>• Water use management policies and programs of water users<br>• Enforcement<br>• Guidelines<br>• Water and wastewater treatment practices |
| | | | • BRBC | • Forum for information sharing and discussion<br>• State of the river report<br>• Survey of urban water use management<br>• Joint stakeholder projects |
| | Riparian rights<br>(Section F.3) | • Subject to the *Water Act* and the *Environmental Protection and Enhancement Act*.<br>• Governs water use by owners of land adjoining a watercourse. | | |
| | *Natural Resources Transfer Agreement*<br>(Section F.4.1) | • Gave the Government of Alberta ownership of most water and other natural resources within Alberta. | • Governments of Canada and Alberta | |
| | | • Apportionment of the flow of the St. Mary and Milk Rivers. (This apportionment influences the availability of water in the South Saskatchewan River Basin and, therefore, could affect water management in the Bow Basin.) | • International Joint Commission | • *Boundary Waters Treaty* (Section F.2) |
| | | • The *Master Agreement on Apportionment* applies to drainage basins shared by the prairie provinces. (Section F.4.2) | • PPWB | • Formula for sharing interprovincial water among the prairie provinces<br>• Forum for resolving issues among the prairie provinces |

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## Table A.1 Guide to Key Laws and Other Institutional Arrangements (Continued)

| Issue | Laws | Jurisdiction | Organization | Other Arrangements |
|---|---|---|---|---|
| Water wells | *Water Act*<br>(Section E.3.8) | • The *Water Act* governs the diversion and use of water in Alberta. It regulates actions that affect water and water use management. | • RS, AENV | • Except for household use, in some situations a licence is required before water is diverted from an aquifer<br>• Enforcement<br>• Ground water management practices<br>• Water well management practices |
|  | *Environmental Protection and Enhancement Act* (EPEA)<br>(Section E.3.2) | • EPEA regulates water well drilling and the treatment of water for drinking water and other household purposes. | • EA, AENV | • An approval may be required if water will be supplied to others for drinking water and other household purposes<br>• Enforcement |
| Wildlife and wildlife habitat | *Wildlife Act*<br>(Section E.3.9) | • The *Wildlife Act* provides the regulatory framework for the protection and use of wildlife in Alberta. | • Fish and Wildlife, ASRD | • Enforcement<br>• Land use guidelines<br>• Pesticide application practices<br>• Raptor protection practices<br>• Riparian land use practices |

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# B. Organizations Involved in Water Use and Management

## B.1 Organizations and Key Activities

Figure B.1 summarizes the roles and key activities of organizations involved in water use and management in the Bow River Basin. Following the diagram are more detailed descriptions of some of the organizations listed in the figure.

If your organization would like a description of its goals and activities to be included in the *Guidebook*, please contact:

Bow River Basin Council
300, Atrium VII, 340 Midpark Way SE
Calgary, AB
T2X 1P1

Tel: (403) 254-3419
Fax: (403) 254-3333
E-mail: shamza@earthtech.ca
Internet: www.brbc.ab.ca

The Pembina Institute also maintains the *Alberta Environmental Directory*, an annotated guide to Alberta's environmental organizations, and agencies. It contains over 400 listings. The directory can be viewed on the Internet at:

http://www.piad.ab.ca/aed.htm

Electronic and printed versions of the *Directory* can be purchased from

The Pembina Institute
Box 7558
Drayton Valley, AB
T7A 1S7

Tel: (780) 542-6272
Fax: (780) 542-6464
E-mail: piad@pembina.org

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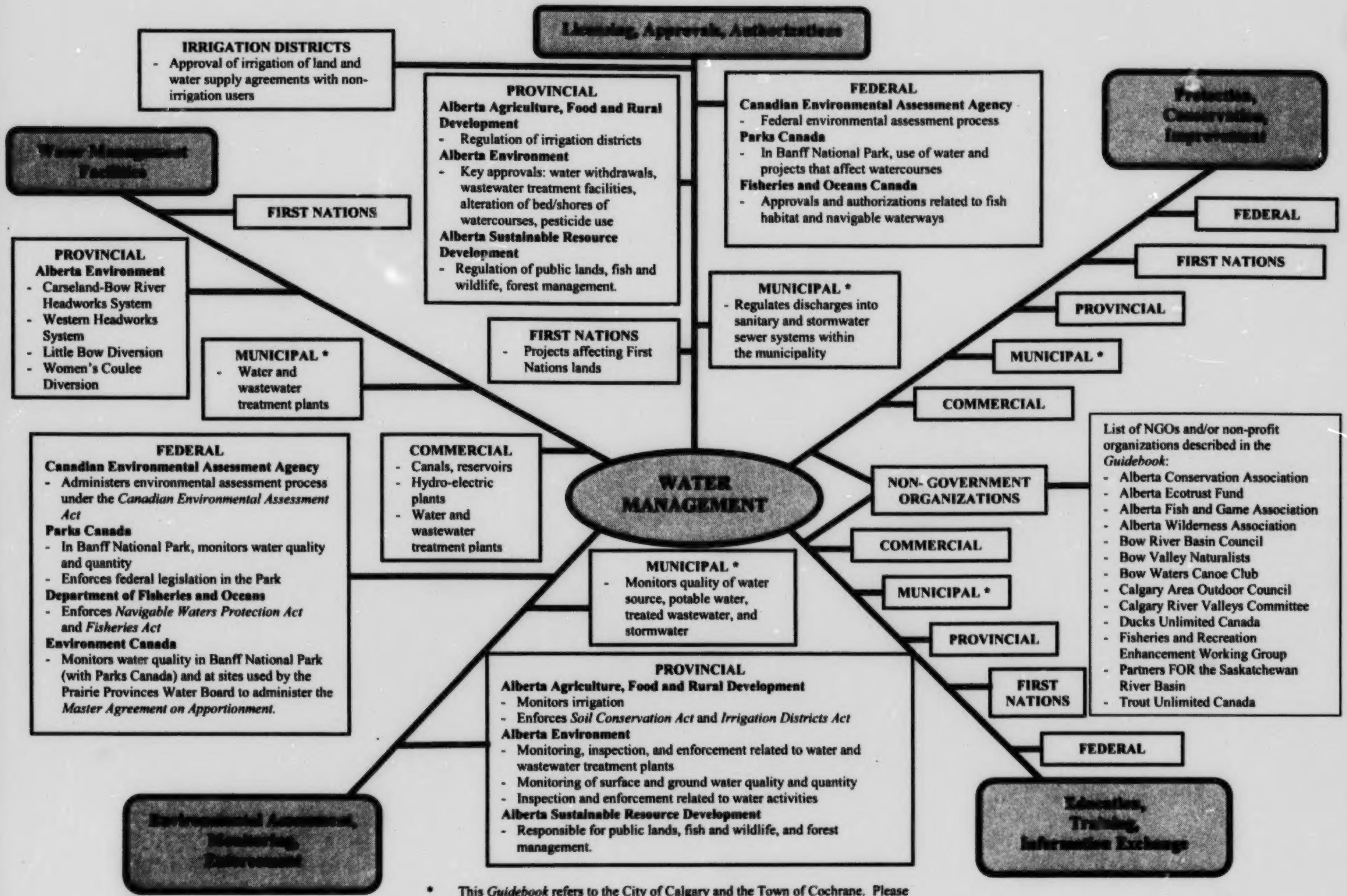
NOTE: The term *water management* includes a wide variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge, and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

**Figure B.1 Guide to Organizations and Key Activities**



WATER MANAGEMENT

**Licensing, Approvals, Authorizations**

**IRRIGATION DISTRICTS**
- Approval of irrigation of land and water supply agreements with non-irrigation users

**PROVINCIAL**
**Alberta Agriculture, Food and Rural Development**
- Regulation of irrigation districts

**Alberta Environment**
- Key approvals: water withdrawals, wastewater treatment facilities, alteration of bed/shores of watercourses, pesticide use

**Alberta Sustainable Resource Development**
- Regulation of public lands, fish and wildlife, forest management.

**FEDERAL**
**Canadian Environmental Assessment Agency**
- Federal environmental assessment process

**Parks Canada**
- In Banff National Park, use of water and projects that affect watercourses

**Fisheries and Oceans Canada**
- Approvals and authorizations related to fish habitat and navigable waterways

**FIRST NATIONS**
- Projects affecting First Nations lands

**MUNICIPAL ***
- Regulates discharges into sanitary and stormwater sewer systems within the municipality

**Water Management Facilities**

FIRST NATIONS

**PROVINCIAL**
**Alberta Environment**
- Carseland-Bow River Headworks System
- Western Headworks System
- Little Bow Diversion
- Women's Coulee Diversion

**MUNICIPAL ***
- Water and wastewater treatment plants

**COMMERCIAL**
- Canals, reservoirs
- Hydro-electric plants
- Water and wastewater treatment plants

**Protection, Conservation, Improvement**

FEDERAL

FIRST NATIONS

PROVINCIAL

MUNICIPAL *

COMMERCIAL

NON- GOVERNMENT ORGANIZATIONS

List of NGOs and/or non-profit organizations described in the *Guidebook*:
- Alberta Conservation Association
- Alberta Ecotrust Fund
- Alberta Fish and Game Association
- Alberta Wilderness Association
- Bow River Basin Council
- Bow Valley Naturalists
- Bow Waters Canoe Club
- Calgary Area Outdoor Council
- Calgary River Valleys Committee
- Ducks Unlimited Canada
- Fisheries and Recreation Enhancement Working Group
- Partners FOR the Saskatchewan River Basin
- Trout Unlimited Canada

**Environmental Assessment, Monitoring, Enforcement**

**FEDERAL**
**Canadian Environmental Assessment Agency**
- Administers environmental assessment process under the *Canadian Environmental Assessment Act*

**Parks Canada**
- In Banff National Park, monitors water quality and quantity
- Enforces federal legislation in the Park

**Department of Fisheries and Oceans**
- Enforces *Navigable Waters Protection Act* and *Fisheries Act*

**Environment Canada**
- Monitors water quality in Banff National Park (with Parks Canada) and at sites used by the Prairie Provinces Water Board to administer the *Master Agreement on Apportionment.*

**MUNICIPAL ***
- Monitors quality of water source, potable water, treated wastewater, and stormwater

**PROVINCIAL**
**Alberta Agriculture, Food and Rural Development**
- Monitors irrigation
- Enforces *Soil Conservation Act* and *Irrigation Districts Act*

**Alberta Environment**
- Monitoring, inspection, and enforcement related to water and wastewater treatment plants
- Monitoring of surface and ground water quality and quantity
- Inspection and enforcement related to water activities

**Alberta Sustainable Resource Development**
- Responsible for public lands, fish and wildlife, and forest management.

**Education, Training, Information Exchange**

COMMERCIAL

MUNICIPAL *

PROVINCIAL

FIRST NATIONS

FEDERAL

* This *Guidebook* refers to the City of Calgary and the Town of Cochrane. Please note that other municipalities conduct water management activities (see your phone book for contacts).

## B.2 Commercial Water Users

### B.2.1 Bow River Irrigation District (BRID)

The BRID is governed by a seven-member board of directors who are elected by and from the water users in the District. The Board governs according to the *Irrigation Districts Act* of the Province of Alberta. Presently, the District conveys water through its works to approximately 210,000 irrigated acres, approximately 75 acreages, towns, villages, water co-ops, industries, parks, golf courses, and wildlife projects administered by Ducks Unlimited and Alberta Environment. The works of the district include approximately 1,000 km of canals, 150 km of pipelines, 770 km of drainage channels, and several reservoirs of various sizes. The reservoirs are extensively used by the public for recreation.

For further information, contact:

Bow River Irrigation District
Box 140
807 – 7 Avenue North
Vauxhall, AB
T0K 2K0

Tel: (403) 654-2111
Fax: (403) 654-4197

### B.2.2 Eastern Irrigation District (EID)

Organized under the *Irrigation Districts Act* of Alberta, the EID operates, administers and maintains a comprehensive network of canals, reservoirs and drains in support of irrigated agriculture. In addition, it operates its facilities in a manner that benefits the regional economy, municipalities, industry, recreation, and the environment. Its administrative region covers an area in excess of 1.5 million acres.

Earl Wilson, General Manager
P.O. Bag 8
550 Industrial Road
Brooks, AB
T1R 1B2

Tel: (403) 362-1400
Fax: (403) 362-6206
E-mail: eid@eidnet.org
Internet: www.eid.ab.ca

## B.2.3 TransAlta Utilities Corporation (TAU)

TAU operates six storage reservoirs and eleven hydroelectric plants in the Bow River Basin. During runoff season, reservoirs are filled to provide for power generation through the rest of the year. Hydropower is very important because it can respond quickly to changes in power demand. The Bow hydropower system is mainly used to supply power during periods of the day when electrical demand is highest. Important water management benefits of hydropower operations include control of river flow during runoff periods and flow augmentation during fall, winter and early spring. TAU is a supporter of and participant in a number of initiatives promoting improvements in water management including the Bow River Basin Council and the Fisheries and Recreation Enhancement Working Group (FREWG).

For further information, contact:

Roger Drury, Supervisor
Hydro Engineering Services
TransAlta Utilities Corporation
409 River Avenue
Cochrane, AB
T4C 2C1
Tel: (403) 932-8492
Fax: (403) 932-8420

## B.2.4 Western Irrigation District (WID)

Organized under the *Irrigation Districts Act* of Alberta, the WID operates, maintains, and administers a system of irrigation canals, reservoirs, and drains east of Calgary. The WID administers over 85,000 acres of irrigable land. In addition to supplying water for irrigated agriculture, the WID supplies water to various other users such as municipalities, subdivisions, industries, and recreational users.

For further information, contact:

Western Irrigation District
201 Pine Road
Strathmore, AB
T1P 1C1
Tel: (403) 934-3542
Fax: (403) 934-5101

## B.3 Federal Government

### B.3.1 Department of Canadian Heritage, Parks Canada

***Purpose***

To fulfill national and international responsibilities in mandated areas of heritage recognition and conservation. To commemorate, protect and present, both directly and indirectly, places that are significant examples of Canada's cultural and national heritage in ways that encourage public understanding, appreciation and enjoyment of this heritage, while ensuring long-term ecological and commemorative integrity.

***Mandate***

Parks Canada plays a leading role in federal government activities related to recognizing places representative of Canada's natural heritage and places of national historic importance, and in protecting and presenting these places to the public. Parks Canada's heritage activities entail direct responsibility for the management of federal lands and their associated resources (e.g., Banff National Park).

Parks Canada's activities in the Bow River Basin are summarized below.

***Approvals (including licences and permits)***

Key approvals that Parks Canada issues within Banff National Park are for:

- use of water
- development projects within national parks affecting watercourses.

Parks Canada also issues licences and permits for fishing and fish guiding (Lake Minnewanka only).

***Bow River Basin Council (BRBC)***

Parks Canada, Banff National Park, has one member on the BRBC.

### *Emergency Response*

Parks Canada, Banff National Park, works in conjunction with provincial agencies when dealing with emergency response relating to hazardous or toxic spills. The park maintains a formalized toxic spill plan to deal with road, rail, and other incidents.

### *Enforcement*

Within Banff National Park, Parks Canada is responsible for enforcing these laws:

- *National Parks Act* and regulations
- *Canadian Environmental Assessment Act*
- *Fisheries Act* in cooperation with the Department of Fisheries and Oceans
- *Navigable Waters Protection Act* in cooperation with the Department of Fisheries and Oceans
- *Canadian Environmental Protection Act* in cooperation with Environment Canada.

### *Treaties, Agreements, and Other Legal Arrangements*

- *Convention on International Trade in Endangered Species* (CITES)
- *Convention of Biological Diversity*
- *World Charter for Nature*
- *World Conservation Union*

### *Jurisdictional Responsibilities*

Within Banff National Park, federal and provincial responsibilities are:

*Federal Responsibilities*

- Parks Canada has jurisdiction over sport fishing under the *National Parks Act*
- Department of Fisheries and Oceans is responsible for the conservation and protection of fish and fish habitat under the *Fisheries Act*
- Park management plans developed and administered by Parks Canada address protection of aquatic resources and ecosystem integrity
- Banff and Lake Louise wastewater treatment plants and the Peyto Lagoon operate under federal (Lake Louise, Peyto Lagoon) and provincial (Banff) guidelines/standards. Both Banff and Lake Louise are striving to meet the Mountain National Park Leadership Standards for Wastewater Treatment Plants in Mountain National Parks

*Provincial Responsibilities*

- Alberta Environment monitors effluent results and reporting from the Banff sewage treatment plant. Parks Canada reviews effluent results from the Lake Louise treatment plant.
- Alberta Environment enforces provincial guidelines/standards at the Banff wastewater treatment plant, while Parks Canada undertakes a similar role for the Lake Louise plant.
- The Headwaters Health Authority monitors drinking water.

***Monitoring and Analysis***

Parks Canada and Environment Canada (Inland Waters) routinely monitor water quality and quantity within Banff National Park. Monitoring is carried out to ensure that threats to park ecosystems from human activities are identified and action is taken to minimize or eliminate such threats.

***Planning and Management***

Parks Canada will seek mutually satisfactory solutions to trans-boundary concerns associated with the management of shared ecosystem components, the effects of adjacent land use practices on park ecosystems, or the effects of park management practices on adjacent lands.

For further information, contact:

Superintendent, Banff National Park
Box 900
Banff, AB
T0L 0C0
Tel: (403) 762-1510
Fax: (403) 762-1583

## B.3.2 Department of Fisheries and Oceans (DFO) Canadian Coast Guard

The Canadian Coast Guard – Navigable Waters Protection Program (NWP Program) is responsible for the administration and enforcement of the *Navigable Waters Protection Act*. In administering the Act, the NWP Program is responsible for:

- the approval of any works in, upon, over, under, through or across any navigable waterway in Canada prior to construction or placement of the work(s)
- the removal of obstructions to navigation, including unauthorized works or other obstruction such as sunken or wrecked vessels

- the inspection, investigation and enforcement of the Act, as it relates to any work, obstruction or wreck in a navigable waterway.

*What is a navigable waterway?*

The determination of whether or not a waterway is actually considered "navigable" rests with the Minister or designated representative. For the convenience of the general public the following administrative definition is provided:

> *Navigable waters* include any body of water capable, in its natural state, of being navigated by floating vessels of any description for the purpose of transportation, recreation or commerce; as well as any waterway where the public right to navigation exists by dedication of the waterway for public purpose or by the public having acquired the right to navigate through long use.

For further information, contact:

Canadian Coast Guard
4253 – 97 Street
Edmonton, AB
T6E 5Y7
Tel: (780) 495-6325

## B.4 Municipalities

### B.4.1 City of Calgary

The City of Calgary operates two water treatment plants and two wastewater treatment plants. The Bearspaw Water Treatment Plant withdraws water from the Bow River and the Glenmore Water Treatment Plant withdraws water from the Elbow River. Both wastewater treatment plants – Bonnybrook and Fish Creek – discharge tertiary treated effluent to the Bow River. The City manages extensive systems for the distribution of treated water, the collection of wastewater from homes, institutions, industries, and other businesses, and the collection and control of stormwater run-off. The City also is responsible for riverbank stabilization and floodplain management within the city and has an ongoing program for monitoring and testing the quality of source water, potable water, treated wastewater, and stormwater.

For further information, contact:

Water Treatment
Waterworks Administration
Tel: (403) 268-5721

Treatment Plant (main line)
Tel: (403) 268-3855

Wastewater Treatment
Wastewater & Drainage Administration
Tel: (403) 268-5731

## B.5 Non-Government Organizations

### B.5.1 Alberta Conservation Association (ACA)

The ACA was formed April 1, 1997, and has been delegated much of the authority and responsibilities of the former Fish and Wildlife Trust Fund. Incorporated under the *Alberta Societies Act*, the ACA is a separate legal entity, independent of government. The ACA:

- establishes and collects enhancement levies on hunting and sportfishing licences
- inventories, develops, and enhances populations of fish, wildlife, and endangered species in Alberta
- pays people who assist in the detection of resource related violations ("Report A Poacher")
- provides compensation for damage or loss caused by wildlife or the use of a weapon during an open hunting season.

The ACA's functions are carried out in a manner consistent with the resource management priorities of Alberta Environment.

The seven member organizations of the ACA are:

- Trout Unlimited Canada
- Western Walleye Council
- Alberta Fish and Game Association
- Professional Outfitters Association of Alberta
- Alberta Trappers Association
- Federation of Alberta Naturalists
- Treaty Eight First Nations of Alberta.

The ACA has a 13-member Board of Directors and a staff of approximately 50 seasonal employees.

Four of the ACA's programs with the most direct relevance to water management are:

- Fisheries Management Enhancement Program: collection and analysis of biological data to enhance fish production and protection
- Fisheries Habitat Development Program: retention, enhancement, or creation of fish habitat, with a focus on self-sustaining species
- Wildlife Management Enhancement Program: supports and undertakes management, research and educational projects that ensure the well being and perpetuation of Alberta's wildlife resources
- Wildlife Habitat Development Program: retention, enhancement, or creation of wildlife habitat, with a focus on species requiring support and long-term retention of high-quality habitat.

For further information, contact:

Alberta Conservation Association
P.O. Box 40027
Baker Centre Post Office
Edmonton, AB
T5J 4M9

Toll-free: 1-877-969-9091
Tel: (780) 427-5192
Fax: (780) 422-6441
Internet: www.ab-conservation.com

## B.5.2 Alberta Ecotrust Foundation

The Alberta Ecotrust Foundation is a registered charitable organization established to help Albertans protect and conserve the environment. It is a cooperative partnership between corporations and environmental organizations with a mandate to provide grants and consultative advice implementing practical grassroots initiatives that result in improved environmental quality. The Foundation's Board consists of equal representation from the corporate sector and the environmental sector. The Board is co-chaired by a representative from each sector and is elected yearly. Any registered not-for-profit society in Alberta with a public interest or public service mandate is eligible to apply for funding. The Foundation provides matching grants in the range of $2,000 to $20,000. Deadlines for proposals are March 15 and September 15 each year. Applicants are encouraged to call the office for a consultation prior to submitting an application.

For further information, contact:

Pat Letizia, Executive Director
Alberta Ecotrust Fund
102, 725 – 12 Avenue SW
Calgary, AB
T2R 0H9

Tel: (403) 209-2245 or 1-800-465-2147
Fax: (403) 209-2086
E-mail: ecomail@albertaecotrust.com
Internet: www.albertaecotrust.com

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996).

### B.5.3 Alberta Fish and Game Association (AFGA)

The AFGA's mission is to promote, through education, lobbying and programs, the conservation and utilization of fish and wildlife and to protect and enhance the habitat they depend on. The AFGA sponsors hunting education programs and firearm safety, monitors management of fish and wildlife, and participates in fish and wildlife advisory committees and policy development activities. The AFGA is a founding member of the Alberta Conservation Association. It also has established several habitat-related programs include Habitat Steward, Heritage Farmsteads for Wildlife, Operation Grassland Community, and the Wildlife Trust Fund.

For further information, contact:

Brad Fenson, Alberta Fish and Game Association
6924 – 104 Street
Edmonton, AB
T6H 2L7

Tel: (780) 437-2342
Fax: (780) 438-6872
E-mail: office@afga.org

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996).

### B.5.4 Alberta Wilderness Association (AWA)

The AWA is a registered Alberta charity constituted in 1968. It is a vocal, public watchdog for wilderness and wild river protection and conservation in Alberta.

Mission: Defending Wild Alberta Through Awareness and Action
Goal: To see established throughout Alberta a system of large, interconnected wildlands and wild rivers that are legally protected.
Activities: Researching, defending, educating, and advocating for wildlands, wild rivers and wildlife.

Publications:

- *Eastern Slopes Wildlands: Our Living Heritage*
- *Rivers on Borrowed Time*
- *Willmore Wilderness Park*
- *Wild Alberta* (illustrated map of lands and rivers in need of protection)

For further information, contact:

Cliff Wallis, President
Alberta Wilderness Association
Box 6398, Station D
Calgary, AB
T2P 2E1

Tel: (403) 283-2025
Fax: (403) 270-2743
E-mail: a.w.a@home.com
Internet: www.albertawilderness.ca

## B.5.5 Bow River Basin Council

The Bow River Basin Council (BRBC) is a registered charitable organization whose purpose is to conduct activities for the improvement and protection of the waters of the Bow River Basin with respect to any cultural, economic, environmental and social aspects of the:

- quality and quantity of ground water and surface water
- riparian zones
- effects of human activity and land use on ground water and surface water quality and quantity
- aquatic ecosystems.

The BRBC's vision is that the waters of the Bow River Basin will be conserved and protected as a fragile and unique resource and recognized as our lifeline. Multiple uses will be balanced, ensuring the needs of all stakeholders are met, while recognizing that a healthy ecosystem is paramount.

The BRBC provides a forum for all members to:

- share perspectives and exchange information
- prioritize water use management issues in the basin that may affect the quality and/or quantity of ground water, surface water, or riparian zones
- participate in water use management and planning activities
- develop and recommend improved water use management procedures and performance measures
- encourage the implementation of cooperative water use management strategies
- participate in activities that promote and demonstrate increased awareness of water use management issues to its members, the governments of Alberta and Canada, and the public.

Membership with the Council is open to any interested individual or organization.

For further information, contact:

Bow River Basin Council
300, Atrium VII, 340 Midpark Way SE
Calgary, AB
T2X 1P1

Tel: (403) 254-3419
Fax: (403) 254-3333
E-mail: shamza@earthtech.ca
Internet: www.brbc.ab.ca

### B.5.6 Bow Valley Naturalists

Founded in 1967, the Bow Valley Naturalists is an incorporated society with a charitable status. The society is interested in the study of natural history and the protection of natural systems. Its main areas of interest are Banff National Park and the Bow-Canmore Corridor. Annual membership fee: $5.00. Average number of members/year: 100.

For further information, contact:

Bow Valley Naturalists
Box 1693
Banff, AB
T0L 0C0

Tel/Fax: (403) 762-4160
E-mail: mcivor@telusplanet.net

## B.5.7 Bow Waters Canoe Club

Bow Waters Canoe Club in Calgary provides recreational canoeing opportunities for members and canoeing lessons for individuals and a wide variety of both adult and juvenile groups. The club has been in existence since 1972 and has over 500 members at the current time, served from a clubhouse on the Western Irrigation District canal. Each season there are over 100 organized trips for individuals and groups, ranging from novice to expert skill level on the rivers in Southern Alberta.

For further information, contact:

Bow Waters Canoe Club
BOX 697, STN J
Calgary, AB
T2A 4X8

Tel: (403) 235-2922
Fax: (403) 235-2993
E-mail: bwcc@telusplanet.net
Internet: www.bowwaters.org

## B.5.8 Calgary Area Outdoor Council (CAOC)

CAOC is an umbrella organization for clubs, organizations, retail establishments, institutions, and government departments involved in outdoor recreation. It is a centre for information and resource sharing that provides answers to a wide variety of questions relating to outdoor opportunities, issues, and events. One of CAOC's main goals is to promote safe, healthy, responsible outdoor recreation. CAOC plans workshops, organizes forums on outdoor issues (such as backcountry rescue fees), and organizes outdoor festivals. CAOC's publications include the *Guide to Outdoor Recreation* and *Odyssey*, a newspaper for the outdoor enthusiast.

For further information, contact:

Calgary Area Outdoor Council
1111 Memorial Drive NW
Calgary, AB
T2N 3E4

Tel: (403) 270-2262

## B.5.9 Calgary River Valleys Committee (RVC)

The RVC is mandated by Calgary City Council to protect and enhance the natural, historical, and cultural values of Calgary's river valleys ecosystem. The RVC's objectives are to educate the public about the unique prairie foothills character of the river valleys, to promote their management and protection, and to support and develop projects that are compatible with this use. Under the auspices of Parks Foundation, Calgary, the RVC provides coordinated input to City Council on important river valley issues based on the *Calgary River Valleys Plan*, the *Urban Parks Master Plan*, and the combined leadership and consensus of its member organizations. Over 40 organizations and government agencies are members of the RVC.

For further information, contact:

River Valleys Committee
Suite 1725, 645 – 7 Avenue SW
Calgary, AB
T2P 4G8

Tel: (403) 974-0751
Fax: (403) 974-0758

## B.5.10 Ducks Unlimited Canada

Ducks Unlimited Canada is a private, non-profit conservation organization with the vision of "a mosaic of natural restored and managed landscapes capable of perpetually sustaining populations of waterfowl and other wildlife." Ducks Unlimited has been actively conserving habitat in Alberta since 1938 and has offices throughout the province. There are three Field Offices: Grande Prairie, Edmonton, and Brooks – and satellite offices in St. Paul, Wainwright, Tofield, Camrose, Red Deer, Hanna, Strathmore, and Lethbridge. There are two district offices in Camrose and Brooks. The Prairie regional office is in Edmonton.

For further information, contact:

Ducks Unlimited Canada
200, 10720 - 178 Street
Edmonton, AB
T5S 1J3

Tel: (780) 489-2002
Fax: (780) 489-1856
Internet: http://www.ducksunlimited.ca
E-mail: du_edmonton@ducks.ca

## B.5.11 Fisheries and Recreation Enhancement Working Group (FREWG)

FREWG was formed in 1992. Its objectives are to define management objectives for fish and recreational uses within waters affected by hydroelectric operations in Alberta, assess issues and concerns, evaluate options, determine strategies for improvement, and implement, monitor, and evaluate approved strategies. The members of FREWG are Trout Unlimited Canada, TransAlta Utilities, Parks Canada, Department of Fisheries and Oceans, Alberta Community Development, Alberta Sustainable Resource Development, and Alberta Environment. FREWG's top priority is evaluating options for improving the management of water for fish and recreational uses in the Kananaskis River system. Two key activities are determining instream needs (IN) for the Kananaskis River between Lower Kananaskis Lake and Barrier Lake and conducting a review of management options for Lower Kananaskis Lake. The options being evaluated include no change from the current operating strategy, stabilizing the water level of Lower Kananaskis Lake, fish stocking, fertilization, and changes in the flow of the Kananaskis River.

For further information, contact:

Bob Morrison, FREWG Chairman
Southern Region, Alberta Environment
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7

Tel: (403) 297-6462
Fax: (403) 297-6069
E-mail: Robert.S.Morrison@gov.ab.ca

## B.5.12 Partners FOR the Saskatchewan River Basin

The Saskatchewan River Basin extends from the Rocky Mountains to Lake Winnipeg and is home to nearly 3 million people. The River Basin Project is an environmental stewardship program designed to increase public awareness and stewardship of the basin's natural and cultural heritage. The partner organizations assist in ensuring that a wide range of information, education, and stewardship projects are developed and implemented. Some of the projects include: a basin fact sheet series, Volunteer Water Monitoring Program, a basin ecozone map, poster and teacher's guide, an Eco-Canoe Guide for the South Saskatchewan River, and an extensive database on the basin. A new initiative is the Water Watchdog Program, a hands-on water quality monitoring program geared towards children 7-14 years of age.

A quarterly newsletter, a website: (http://www.saskriverbasin.ca) and regular workshops keep the partners up to date on the activities throughout the basin. Membership fees range from $20.00 for individuals to $35.00 - $200.00 for organizations based on their annual budget.

For further information, contact:

Partners FOR the Saskatchewan River Basin
402 – Third Avenue South
Saskatoon, SK
S7K 3G5

Tel: (306) 665-6887
Or 1-800-567-8007
Fax: (306) 665-6117
E-mail: partners@saskriverbasin.ca

### B.5.13 Trout Unlimited Canada (TUC)

TUC is a national, not-for-profit organization whose members and professional staff work to protect, conserve and enhance coldwater fish and their habitats through restoration, research, public awareness and education. TUC has three active chapters in the Bow River Basin: Upper Bow Valley (Banff-Canmore), Jumpingpound (Cochrane), and Bow River (Calgary).

For further information, contact:

Trout Unlimited Canada
1130 - 12 Street SW
Calgary, AB
T3C 1A7

Tel: (403) 221-8360
Or 1-800-909-6040
Internet: http://www.tucanada.org
E-mail: tuc@tucanada.org

## B.6 Provincial Government

The Alberta Government's activities in the Bow River Basin are summarized in Table B.1. Organization charts for Alberta Environment and Alberta Sustainable Resource Development are shown in Figures B.2 and B.3. The Bow Region is shown in Map B.1.

## Table B.1 The Alberta Government's Water Management Related Activities in the Bow River Basin

The Alberta Government is involved in a wide variety of activities in the Bow River Basin that have an influence on water management. Key activities are listed below.

**Approvals (including licences and permits)**
The key activities for which the Alberta Government issues approvals are:

- alteration of the beds and banks of watercourses or water bodies
- discharge of effluent
- diversion and use of water
- facility development, disturbances, and other use of public land and in protected areas (e.g., parks).
- land reclamation for linear disturbances and resource extraction (e.g., sand and gravel pits, oil wells)
- municipal and industrial waste management facilities
- pesticide use and certification of applicators
- stormwater discharge and stormwater management facilities
- timber harvesting
- water treatment plants

**Bow River Basin Council**
The Alberta Government has three members on the Council and provides funding for the Council's activities.

**Emergency Response**
Alberta Environment (AENV) maintains a toll-free emergency line to respond to environmental emergencies, industry notification, and public complaints.

24-hour, toll-free environmental emergency/complaints line: 1-800-222-6514 or Cellular #7378

AENV is a partner in the Flood Damage Reduction Program. Through the Program, municipalities "designate" floodplains and apply rules to prevent floodprone development. As of February 2002, Black Diamond, Calgary, Canmore, Cochrane, Turner Valley, M.D. of Bighorn, M.D. of Foothills (in the Black Diamond-Turner Valley area), and Okotoks had designated floodplains in the basin.

The Dam Safety Program ensures that major water management works (public and private) are designed and inspected to prevent structural failure.

**Enforcement**
The Alberta Government is responsible for enforcing these laws:

- *Environmental Protection and Enhancement Act*
- *Water Act*
- *Wildlife Act*
- *Forests Act*
- *Public Lands Act*
- *Provincial Parks Act**
- *Wilderness Areas, Ecological Reserves and Natural Areas Act**
- *Migratory Birds Convention* (Canada)
- *Fisheries Act* (Canada) – portions of the Act

**Environmental Assessment**
Based on the review of the Environmental Impact Assessment of the Little Bow Project, AENV is revising the diversion plan for withdrawing water from the Highwood River. This is being done as part of the Highwood Management Plan.

**Environmental Education**
The Alberta Government provides a comprehensive program of environmental education dealing with all aspects of water use and management. This includes resource materials, presentations in the classroom and to the public, and support for public involvement and education initiatives.

**Instream Needs**
Through monitoring, approvals, operations, forecasting, coordination, enforcement, and planning, AENV protects the flow and quality of water for human use and environmental requirements such as fish habitat and riparian vegetation.

Instream objectives have been established for portions of the Bow, Highwood and Elbow Rivers as well as smaller streams.

**(Continued)**

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* Proposed to be replaced by new protected area legislation

**Table B.1 (continued)**

**Irrigation**
Alberta Agriculture, Food and Rural Development is responsible for:

- supporting the effective management of irrigation districts and rehabilitation programs to achieve a sustainable irrigation industry.
- enabling sustainable use of soil and water resources for an expanding and globally competitive agri-food industry.
- administering the *Irrigation Districts Act* and the *Soil Conservation Act.*

**Monitoring and Analysis**
AENV maintains a system for monitoring water quality, river flow, diversions, effluent discharges, snowpack, reservoir levels, and water supply outlook. This system is coordinated with the monitoring efforts of federal and municipal governments, irrigation districts, industries and First Nations. Monitoring is done for protection of instream needs, compliance with approvals, planning, and reporting to the public.

Water quality analysis priorities have been set and water quality modeling for the Bow River Basin will be conducted, as required, to meet those priorities.

**Operation of Works**
AENV operates four major projects in the Bow Basin:

- Carseland-Bow River Headworks System: delivers water from the Bow River to the Bow River Irrigation District, municipalities and other water users
- Little Bow Diversion: delivers water from the Highwood River to irrigators, municipalities and others along the Little Bow River
- Western Headworks System: delivers water from the Bow River to the Western Irrigation District, municipalities and other water users
- Women's Coulee Diversion: delivers water from the Highwood River to irrigators, municipalities and others along Mosquito Creek and the Little Bow River

To improve operations, AENV is developing a real-time operational model for the Bow River Basin. The model will make decisions more visible and improve coordination among key stakeholders.

**Planning**
AENV is preparing three major water plans that affect the basin: the Bow Basin Plan, the South Saskatchewan River Basin Water Management Plan, and the Highwood Management Plan.

AENV continues to refine its water quantity modeling capability to ensure that planning meets stakeholders' needs.

Forest management plans and water management plans are integrated through the development of comprehensive integrated plans for major river basins in Alberta. These regional plans provide a level of detail between provincial policy and operational decision making. They also provide a context and process for stakeholder and government decisions.

Other planning projects that have an influence on water management are:

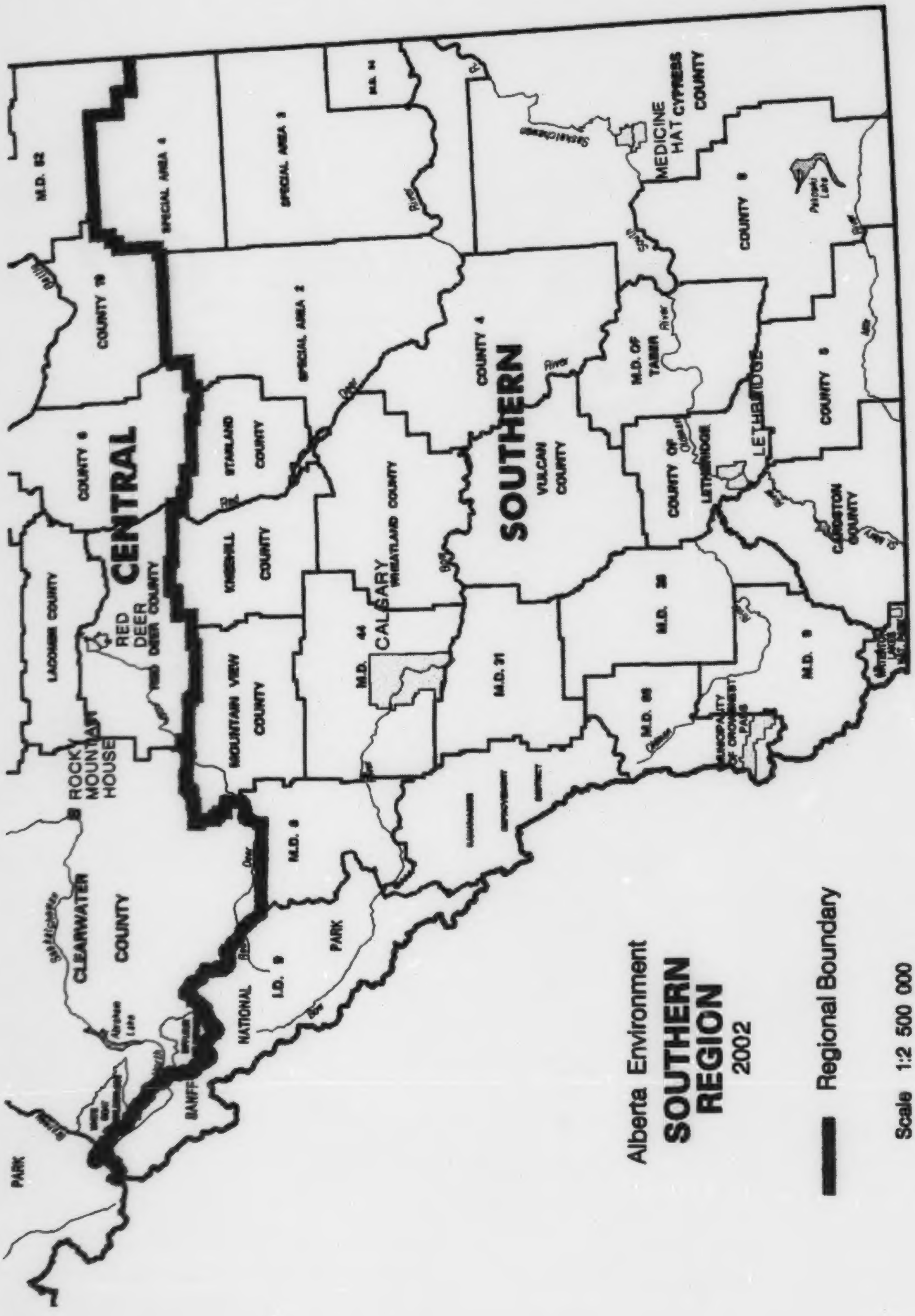
- Kananaskis Country Recreation Development Policy Review
- Bow Valley, Elbow-Sheep Wildland Park and other protected area management plans
- Implementation of
  - Fish Creek Provincial Park Management Plan
  - Eastern Irrigation District Integrated Resource Management Strategy
  - Prairie Conservation Action Plan

**Recreation and Protected Areas**
Within the Bow Basin, Alberta Community Development has management responsibilities for:

- Kananaskis Country (shared responsibility with other government departments)
- ten provincial parks
- eight natural areas
- numerous recreation areas
- a wilderness area (Ghost River)
- an ecological reserve (Plateau Mountain)
- two wildland parks (Bow Valley and Elbow-Sheep)

**Standard and Objective Setting**
AENV establishes province-wide effluent discharge standards and ambient water quality guidelines. These standards and guidelines can be adjusted to meet reach-specific needs during planning and the approval process.

Map B.1 Southern Region – Alberta Environment


M.D. 52
SPECIAL AREA 4
SPECIAL AREA 3
MEDICINE HAT
CYPRESS COUNTY
COUNTY 8
Pakowki Lake
COUNTY 10
SPECIAL AREA 2
COUNTY 4
M.D. OF TABER
LETHBRIDGE
COUNTY 5
COUNTY 6
CENTRAL
STARLAND COUNTY
SOUTHERN
VULCAN COUNTY
COUNTY OF LETHBRIDGE
CARDSTON COUNTY
LACOMBE COUNTY
RED DEER
RED DEER COUNTY
KNEEHILL COUNTY
CALGARY
WHEATLAND COUNTY
M.D. 26
MOUNTAIN VIEW COUNTY
M.D. 44
M.D. 31
M.D. 9
ROCKY MOUNTAIN HOUSE
CLEARWATER COUNTY
M.D. 8
I.D. 9
NATIONAL PARK
BANFF
PARK
MUNICIPALITY OF CROWSNEST PASS
WATERTON LAKES NAT. PARK
Bow River
Oldman River
Red Deer River
Alberta Environment
SOUTHERN REGION
2002
Regional Boundary
Scale 1:2 500 000

## B.6.1 Environmental Protection Advisory Committee (EPAC)

The purpose of EPAC is to provide innovative, proactive and creative advice to the Minister of Environment. Two key functions of the committee are:

- to provide shared learning on key sustainable development trends, issues, challenges and opportunities
- to provide input and advice on innovative strategic and policy initiatives to respond to these trends, issues, challenges and opportunities.

Emphasis is placed on shared learning as opposed to consensus building or decision making.

For further information, contact:

Moe Amery, MLA, Calgary East
EPAC Co-chairman
Suite 550, 2710 – 17 Avenue SE
Calgary, AB
T2A 0P6
Tel: (403) 216-5450
Fax: (403) 216-5452

Internet: http://www.gov.ab.ca/acn/200201/11781.html.

## B.6.2 Alberta Agriculture, Food and Rural Development

*Animal Industry Division*

The mission of the Animal Industry Division is to provide technological leadership and specialized information to support growth of sustainable livestock and livestock product industries.

For further information, contact:

Doug Milligan, Acting Director
204 JG O'Donoghue Bldg.
7000 – 113 Street
Edmonton, AB
T6H 5T6
Tel: (780) 427-2166
Fax: (780) 427-1057
Internet: www.agric.gov.ab.ca

### *Irrigation Council*

The mission of the Irrigation Council is to support the effective management and operation of irrigation districts and their associated infrastructure in order to provide a reliable water supply for a sustainable irrigation industry. The Irrigation Council administers the *Irrigation Districts Act* through its administrative arm, the Irrigation Secretariat. The Irrigation Council assists in administering the Irrigation Rehabilitation Program, which provides financial assistance to the irrigation districts to rehabilitate their infrastructure.

For further information, contact:

Len Ring, Manager, Irrigation Secretariat
Bag 3014, 328 Provincial Bldg.
200 – 5 Avenue S
Lethbridge, AB
T1J 4C7
Tel: (403) 381-5176
Internet: www.agric.gov.ab.ca

### *Resource Management and Irrigation Division*

The mission of the Resource Management and Irrigation Division is to enable sustainable use of resources, in support of an expanding and globally competitive agri-food industry, through essential information, policies, legislation and unique services. The Division administers the *Soil Conservation Act* and assists the Irrigation Council with administration of the *Irrigation Districts Act*.

Program areas include soil conservation, water quality, air quality and biodiversity, coordination of partnerships for environmental programs, irrigation water use management and on-farm advisory services, land and water quality in irrigated areas, and irrigation water allocation, delivery, monitoring and planning.

For further information, contact:

John Tackaberry, Director
206 JG O'Donoghue Bldg.
7000 – 113 Street
Edmonton, AB
T6H 5T6
Tel: (780) 422-4569
Fax: (780) 422-0474
Internet: www.agric.gov.ab.ca

### *Plant Industry Division*

The mission of the Plant Industry Division is to ensure the development of new technology, knowledge, expertise and information that will help the future growth, development and sustainability of the crops industry in Alberta. The Division promotes responsible stewardship of our natural resources and the adoption of responsible pest management practices.

For further information, contact:

Alan Hall, Director
304 JG O'Donoghue Bldg.
7000 – 113 Street
Edmonton, AB
T6H 5T6
Tel: (780) 415-2269
Fax: (780) 422-0783
Internet: www.agric.gov.ab.ca

### *Industrial Development Sector*

The primary mandate of the field portion of the Industry Development Sector is to promote the growth of a competitive, sustainable agriculture and food industry by increasing adoption of sustainable, competitive prices. This is done through applied research, seminars, workshops, consulting services for farmers and processors, and packaging information (Internet, multi-media, and publications) for public use.

For further information, contact:

Don Young
Director, Southern Region
Industry Development Sector
100, 5401 – 1 Avenue S
Lethbridge, AB
T1J 4V6
Tel: (403) 381-5130
Fax: (403) 381-5806

Jim Proctor
Acting Director, Central Region
Industry Development Sector
301 Provincial Bldg.
4920 – 51 Street
Red Deer, AB
T4N 6K8
Tel: (403) 340-7613
Fax: (403) 340-4896

### *Technical Services Division*

The mandate of the Technical Services Division is to support the growth of the agriculture industry through research, testing, and evaluation of equipment, application of legislation and technical standards to intensive livestock production, and assuring an infrastructure is in place to support quality water supplies for domestic and livestock use.

Program areas include animal welfare, engineering services, intensive livestock operations, livestock water supply and quality, and communication and liaison related to industry expansion issues.

For further information, contact:

Morris Seiferling, Director
204 JG O'Donoghue Bldg.
7000 – 113 Street
Edmonton, AB
T6H 5T6

Tel: (780) 427-0674
Fax: (780) 427-1057
Internet: www.agric.gov.ab.ca

## B.6.3 Alberta Community Development

Among the responsibilities of Alberta Community Development are:

- Managing
    - Recreation and protected areas
      Contact:
        - Canmore – Tel: (403) 678-5508
        - Calgary – Tel: (403) 297-5293
        - Brooks – Tel: (403) 362-1232
    - Heritage Rivers Program
      Contact: Recreation and Protected Areas Division
        - Edmonton - Tel: (780) 427-8441
    - Special Places Program
      Contact: Recreation and Protected Areas Division
        - Edmonton - Tel: (780) 427-8441

For further information:

Internet: http://www.cd.gov.ab.ca

## B.6.4 Alberta Environment

In addition to the contacts listed below, you may obtain useful information about Alberta Environment's many roles and activities by visiting the department web site at http://www.gov.ab.ca/env.

***Bow Regional Office***

The Bow Regional Office is a client-based organization focused on the delivery of approvals, enforcement, and monitoring responsibilities of the *Environmental Protection and Enhancement Act* and the *Water Act*. Regional staff also work with the region's municipalities, stakeholders, industry, and public to collectively address issues or concerns involving the environment.

Approvals involve one or more of the following:

- instream activities
- land reclamation
- sand, gravel, mines and pipelines
- pesticides
- contaminated sites management and remediation
- hazardous waste
- municipal waste
- municipal drinking water and wastewater
- industrial facilities (air and water emissions and waste management).

For further information on approvals:
Contact:
- Tel: (403) 297-7602

The Southern Region is also responsible for:

- Issuing
    - Licences for diversion and consumptive use of surface water and ground water
      Contact:
        - Tel: (403) 297-6582

- Managing
    - Multi-purpose water projects
      Contact: Information Centre
        - Tel: (403) 297-3362
        - Fax: (403) 297-2843
        - Website: www.gov.ab.ca/env/info/infocentre

  - Dam safety
    Contact: Raja Liyanage
    - Tel: (780) 422-1359
  - Water management policies, strategies and issues
    Contact: Innovations Division
    - Tel: (780) 427-9288
  - The Alberta Water Management and Erosion Control Program – a financial assistance grant program for municipalities and other local authorities
    Contact:
    - Calgary – Tel: (403) 297-6582

- Monitoring surface and ground water (quality and quantity)
  Contact:

| | |
|---|---|
| - Surface water monitoring: | Tel: (780) 427-3132 |
| - Surface water levels and flow: | Tel: (780) 427-2046 |
| - Surface water quality: | Tel: (780) 427-1933 |
| - Ground water monitoring: | Tel: (780) 427-9915 |
| - Groundwater Information Centre: | Tel: (780) 427-2770 |

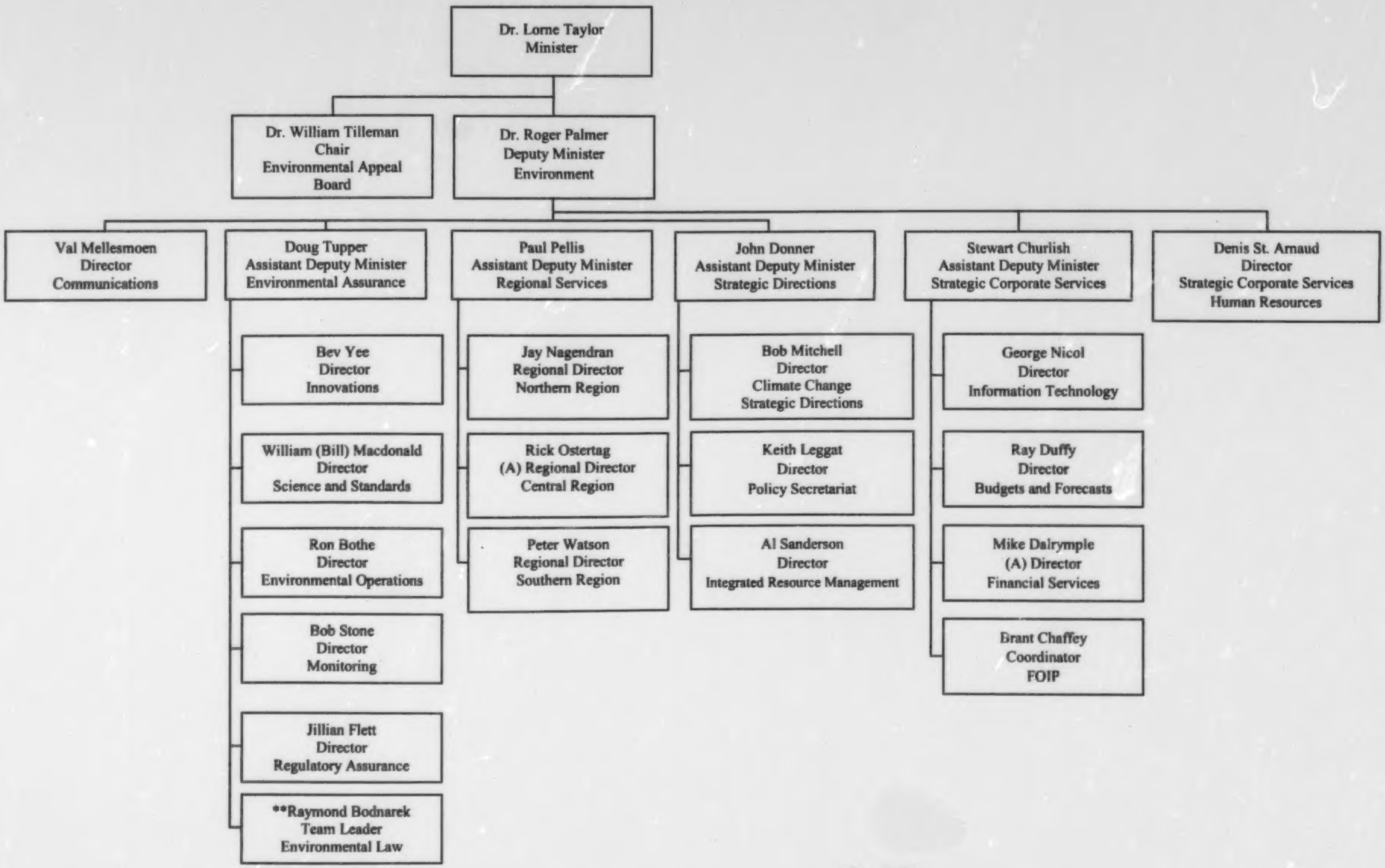
- Compliance with *Water Act*
  Contact:
  - Tel: (403) 297-8271
- Compliance with *Environmental Protection and Enhancement Act*
  Contact:
  - Tel: (403) 297-8271
- Computer modeling and geographic information systems services for water operations and administration.
  Contact:
  - Tel: (403) 297-6563
- Providing environmental education including public and school presentations, resource materials, and support for public involvement and education initiatives.

Contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-3362
Fax: (403) 297-2843
Website: www.gov.ab.ca/env/info/infocentre

Figure B.2 Alberta Environment Organization Chart


Dr. Lorne Taylor
Minister
Dr. William Tilleman
Chair
Environmental Appeal
Board
Dr. Roger Palmer
Deputy Minister
Environment
Val Mellesmoen
Director
Communications
Doug Tupper
Assistant Deputy Minister
Environmental Assurance
Paul Pellis
Assistant Deputy Minister
Regional Services
John Donner
Assistant Deputy Minister
Strategic Directions
Stewart Churlish
Assistant Deputy Minister
Strategic Corporate Services
Denis St. Arnaud
Director
Strategic Corporate Services
Human Resources
Bev Yee
Director
Innovations
William (Bill) Macdonald
Director
Science and Standards
Ron Bothe
Director
Environmental Operations
Bob Stone
Director
Monitoring
Jillian Flett
Director
Regulatory Assurance
**Raymond Bodnarek
Team Leader
Environmental Law
Jay Nagendran
Regional Director
Northern Region
Rick Ostertag
(A) Regional Director
Central Region
Peter Watson
Regional Director
Southern Region
Bob Mitchell
Director
Climate Change
Strategic Directions
Keith Leggat
Director
Policy Secretariat
Al Sanderson
Director
Integrated Resource Management
George Nicol
Director
Information Technology
Ray Duffy
Director
Budgets and Forecasts
Mike Dalrymple
(A) Director
Financial Services
Brant Chaffey
Coordinator
FOIP

**Functional relationship with Alberta Justice and Attorney General

(A) = Acting

## B.6.5 Alberta Sustainable Resource Development

In addition to the contacts listed below, you may obtain useful information about Alberta Sustainable Resource Development's many roles and activities by visiting the department web site at http://www3.gov.ab.ca/srd

### *Public Lands Division*

The mandate of Public Lands Division is to manage the Crown-owned lands including the beds and shores of naturally occurring bodies of water, rivers, streams, watercourses, and lakes in the settled areas of the province. This includes making integrated land-use decisions, granting authority for use, confirming boundaries, investigating unauthorized use, undertaking/supervising reclamation, and promoting practices that improve and sustain the quality of public land.

Public Lands Division also coordinates the development of guidelines and policy for the management of public land (including the Crown-owned beds and shores of water bodies) throughout the settled portion of the province. This integration includes coordination and provincial program delivery between regions and other inter-departmental resource management agencies; specialized technical support to regional and district land management staff; provision of extension services to government staff and the public involving the integration of agricultural, forestry, wildlife, watershed and recreational public land uses; and provision of negotiation and mediation services to resolve conflicts over the allocation of resources and the use of public land.

For further information, contact:

Dan Grahn, Head
Industrial Land Services
200 JG O' Donoghue Bldg.
7000 – 113 Street
Edmonton, AB
T6H 5T6

Tel: (780) 427-4659
Fax: (780) 422-4244
Internet: http://www3.gov.ab.ca/srd/land

### *Land and Forest Division*

Land and Forest Division is responsible for the proper management of Alberta's forest resources on public land and the authorization of commercial and industrial activities on land managed under the *Public Lands Act* in the Green Area. This includes the support of a full range of uses and values including timber production, habitat for wildlife, and areas for parks and wilderness. This is achieved through efforts in five key areas: forest protection (i.e., forest fire management and insect and disease management), forest management (i.e., timber inventory, harvesting inspection and intensive forest management), reforestation, and land management.

Current goals for environmental stewardship of public land include:

- provide guidelines, standards, regulations and legislation for environmental performance requirements to sustain the quality of Alberta's soil on public land
- ensure the long-term sustainability of public land for the benefit of Albertans.

Current goals for preventing and suppressing wildfires include:

- continue to respond to the recommendations outlined in the KPMG Alberta Fire Review 1998 Report
- maintain firebases, lookouts and towers, ranger stations and remote airstrips
- ensure fire infrastructure and equipment are maintained and operated effectively
- increase the capacity of industry, municipalities, aboriginal and other communities to deal with wildfires through training

For further information, contact:

Land and Forest Division Tel: (403) 297-8800
Internet: http://www3.gov.ab.ca/srd/forests.html

***Fish and Wildlife Division***

Alberta Sustainable Resource Development is committed to the wise use and conservation of fish and wildlife resources and the preservation of the intrinsic value they add to the environment as well as the enjoyment of Albertans now and in the future.

Alberta Sustainable Resource Development is also responsible for:

- Managing
  - Fish and wildlife habitat and populations
    Contact: Area Offices
    - Canmore – Tel: (403) 678-5508
    - Calgary – Tel: (403) 297-6183
    - Brooks – Tel: (403) 362-1203

- Enforcing the *Wildlife Act, Migratory Birds Act* (Canada), and *Fisheries Act* (Canada)

  Contact:

  Jim Skrenek
  Director
  100, 3115 12 Street NE
  Calgary, AB
  T2E 7J2
  Tel: (403) 297-5360

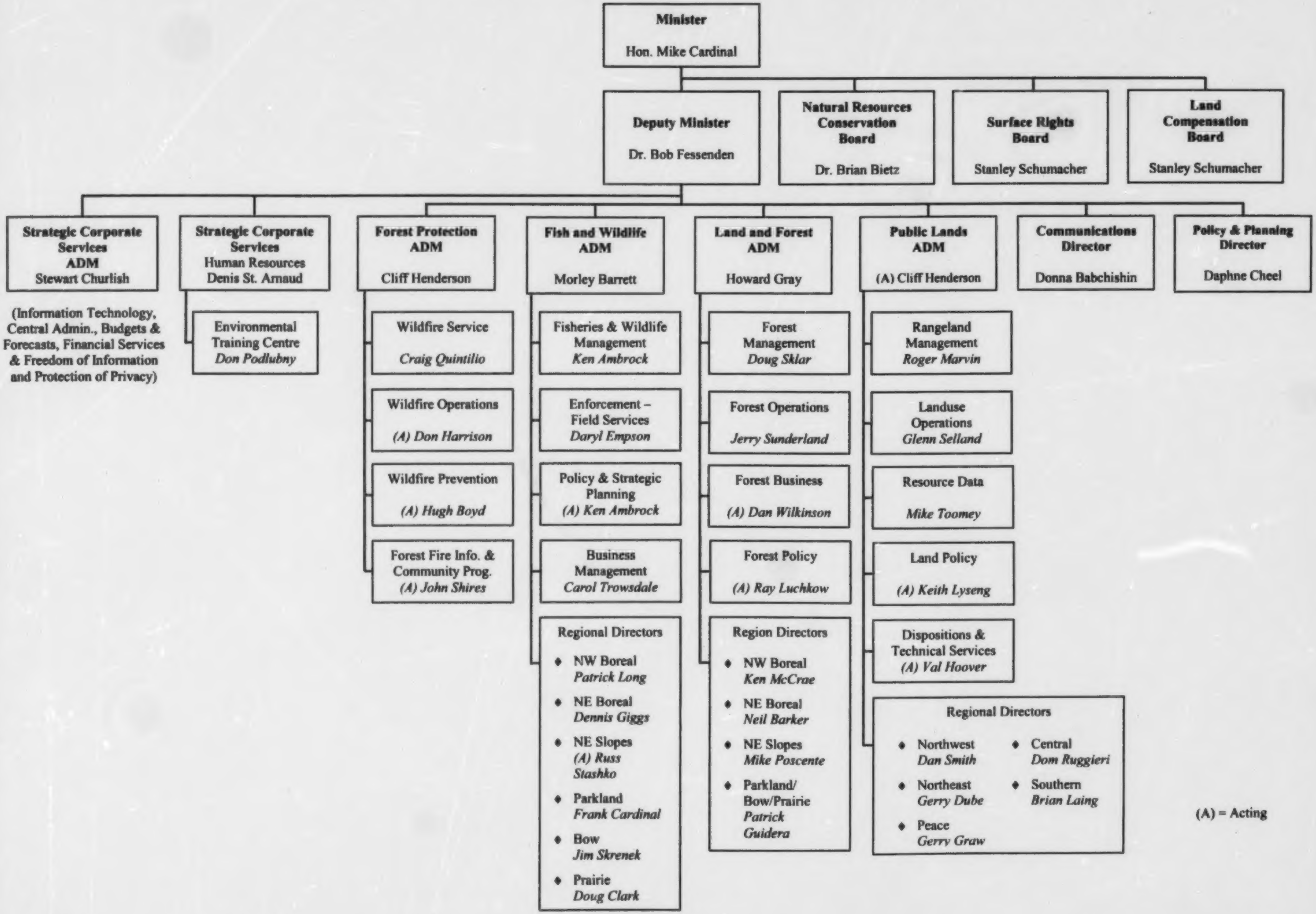
## B.6.6 Calgary Health Region

The Calgary Health Region is responsible for the administration of the *Public Health Act* and its regulations throughout the Calgary region. The important function of the Environmental Health Program is to promote and protect human health. This is accomplished by routine surveillance, investigating public health nuisances (including water quality issues), conducting risk assessments of both existing and prospective land development, responding to public inquiries, and providing assistance to other agencies.

For further information, contact:

Environmental Health Program
Calgary Health Region
P.O. Box 4016, Station C
320 – 17 Avenue SW
Calgary, AB
T2T 5T1
Tel: (403) 228-7570
Fax: (403) 228-8698

**Figure B.3 Alberta Sustainable Resource Development Organization Chart**


Minister
Hon. Mike Cardinal
Deputy Minister
Dr. Bob Fessenden
Natural Resources Conservation Board
Dr. Brian Bietz
Surface Rights Board
Stanley Schumacher
Land Compensation Board
Stanley Schumacher
Strategic Corporate Services ADM
Stewart Churlish
(Information Technology, Central Admin., Budgets & Forecasts, Financial Services & Freedom of Information and Protection of Privacy)
Strategic Corporate Services
Human Resources
Denis St. Arnaud
Environmental Training Centre
Don Podlubny
Forest Protection ADM
Cliff Henderson
Wildfire Service
Craig Quintilio
Wildfire Operations
(A) Don Harrison
Wildfire Prevention
(A) Hugh Boyd
Forest Fire Info. & Community Prog.
(A) John Shires
Fish and Wildlife ADM
Morley Barrett
Fisheries & Wildlife Management
Ken Ambrock
Enforcement – Field Services
Daryl Empson
Policy & Strategic Planning
(A) Ken Ambrock
Business Management
Carol Trowsdale
Regional Directors
◆ NW Boreal Patrick Long
◆ NE Boreal Dennis Giggs
◆ NE Slopes (A) Russ Stashko
◆ Parkland Frank Cardinal
◆ Bow Jim Skrenek
◆ Prairie Doug Clark
Land and Forest ADM
Howard Gray
Forest Management
Doug Sklar
Forest Operations
Jerry Sunderland
Forest Business
(A) Dan Wilkinson
Forest Policy
(A) Ray Luchkow
Region Directors
◆ NW Boreal Ken McCrae
◆ NE Boreal Neil Barker
◆ NE Slopes Mike Poscente
◆ Parkland/ Bow/Prairie Patrick Guidera
Public Lands ADM
(A) Cliff Henderson
Rangeland Management
Roger Marvin
Landuse Operations
Glenn Selland
Resource Data
Mike Toomey
Land Policy
(A) Keith Lyseng
Dispositions & Technical Services
(A) Val Hoover
Regional Directors
◆ Northwest Dan Smith
◆ Northeast Gerry Dube
◆ Peace Gerry Graw
◆ Central Dom Ruggieri
◆ Southern Brian Laing
Communications Director
Donna Babchishin
Policy & Planning Director
Daphne Cheel
(A) = Acting

## C. Jurisdictional Responsibilities

Water in Alberta was once entirely a federal responsibility. Until 1930, the federal government controlled Alberta's natural resources and under the former federal *Irrigation Act* owned water within Alberta and other Prairie Provinces. In 1930, the federal government transferred water and other natural resources within the boundaries of Alberta to provincial jurisdiction.

Since the transfer of natural resources, Alberta has owned its water resources (except for those found on federal lands such as national parks). This ownership provides the province with a great deal of power to regulate the resource, but the *Constitution Act* also provides the federal government with a number of distinct areas of legislative jurisdiction over water. Parks Canada, for example, has jurisdictional responsibility for the headwaters of the Bow River watershed, which drains an area of approximately 3,504 km$^2$.

The division of jurisdiction leaves most authority over water with the provincial government, although this authority is limited by the existence of specific federal powers in the *Constitution*. These powers allow the federal government to legislate in respect of water for specific purposes and limit provincial authority over significant bodies of water. The federal powers are particularly relevant to watercourses, which, like the South Saskatchewan River, flow from one province to another.

The federal powers that have the most direct and continuing impact on water use management are those that deal with fisheries and navigation. Further limits on provincial power exist where provincial regulation might have adverse effects in a downstream province. Each of these possibilities will be considered in turn.

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NOTE: The term *water management* includes a variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge, and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

## C.1 Fisheries

The federal jurisdiction over seacoast and inland fisheries provides the federal government with a secure legal basis for involvement in most major water projects that interfere with fish in some manner. Although federal regulation must be related to fish habitat protection, the authority of the *Fisheries Act* (see section E.2.4) provides the federal government with a potentially important role in the planning of any major water project within the province.

## C.2 Navigation

Under s. 91(10) of the *Constitution Act*, the Parliament of Canada possesses exclusive legislative authority over navigation and consequently over the regulation of navigable waters. The existence of this power has enabled the federal government to pass the *Navigable Waters Protection Act*. Because the courts have adopted a generous definition of "navigability," which includes streams that are sufficient to carry a canoe, virtually all sections of the Bow River and several of its tributaries constitute navigable waters and are subject to some federal jurisdiction. However, any use of federal regulatory authority concerning navigation must be motivated by a proper concern to protect navigation and cannot be used to provide the foundation for water management activities that are broader than regulating navigation.

## C.3 Interprovincial Waters

Provincial authority over water may also be limited where it adversely affects water in a downstream jurisdiction. There are two sources of these limitations on provincial power.

### C.3.1 Residual Power

In addition to its specific powers over navigation and fisheries, the federal government also has a residual power to legislate for the "peace, order and good government of Canada." It is difficult to evaluate precisely how much the federal government under this power obtains jurisdiction over water because its extent is notoriously controversial. The power can clearly support legislation that is not within the normal jurisdiction of the federal government in an emergency or where its subject matter is of "national concern." Many commentators on constitutional law have argued that the national concern stipulation permits federal legislation over pollution in interprovincial rivers. The most extreme view of this power places the pollution of interprovincial waters within the exclusive authority of the federal government.

The implications of the residual power have not yet been a major concern in the case of the Bow River. In the case of water quantity concerns, there is little danger of federal intervention because Alberta's obligations to Saskatchewan are defined by the *Master Agreement on Apportionment* (see section F.4.2). As far as water pollution is concerned, the federal government might be able to pass legislation dealing with pollution in the Bow River that affects downstream users in Saskatchewan. Its validity would be controversial in constitutional law, particularly since the governments of Alberta, Saskatchewan, Manitoba, and Canada agreed, in Schedule E of the *Master Agreement on Apportionment*, to the obligations of each province to take measures to maintain water quality objectives for interprovincial rivers.

### C.3.2 Common Law Limitations

In addition to possible limits placed on provincial authority by the *Constitution*, Canadian courts have suggested that a province must not manage its water in such a way as to cause injury in a downstream province. The *Master Agreement on Apportionment* and its extension in 1992 to include water quality objectives means that there is no significant risk that legislation will be found invalid on this ground, as long as Alberta acts within the terms of the agreement.

# D. Policies, Principles, and Objectives

## D.1 Federal Government

### D.1.1 *Federal Water Policy*

#### *Background and History*

The *Federal Water Policy*, 1987, is a statement of the federal government's philosophy and goals for the nation's freshwater resources. The policy seeks to establish a joint and cooperative management approach with the provinces, which recognizes the provinces' right under the *Constitution Act* to exercise direct control of many aspects of water management. The policy encourages the provision of safe and sufficient water supplies for all Canadians and it develops and applies the concept of a "fair value for water." The policy consists of an overall objective, two specific goals, and five strategies.

#### *Basic Principles*

The overall objective of the *Federal Water Policy* is to encourage the use of freshwater in an efficient and equitable manner consistent with the social, economic, and environmental needs of present and future generations.

The policy's two main goals are:

- to protect and enhance the quality of the water resource
- to promote the wise and efficient management and use of water.

The first goal relates to anticipating and preventing the contamination of all Canadian waters by harmful substances and working to encourage the restoration of those waters that are contaminated. It is realised that more stringent regulations and standards alone cannot protect our water resources without economic incentives (and penalties) to prevent their impairment. This policy emphasizes the promotion of the "polluter pays"

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NOTE: The term *water management* includes a wide variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge, and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

principle, which will re-direct the costs of pollution reduction to those responsible. As a result, costs are distributed more fairly to the benefit of all Canadians and the environment as a whole.

The second goal establishes new ground rules and procedures to reflect the value of water to all sectors of society and to the environment. The key innovation is to recognise the value of the resource – by promoting the realistic *pricing* of water used and by respecting the *value* of recreational water uses and other similar uses where direct charges are not applicable.

### Administration

The *Federal Water Policy* is coordinated and implemented by Environment Canada. The *Federal Water Policy* lists five strategies to reach the objective and goals:

#### *Water Pricing*

Under this strategy, the federal government will:

- endorse the concept of realistic pricing as a direct means of controlling demand and generating revenues to cover costs
- develop new water-efficient technologies and industrial processes that minimize costs and encourage water conservation and improved water quality
- undertake, support, and promote joint federal-provincial examination of the costs and pricing of water for both consumptive and non-consumptive water uses
- encourage the application of pricing and other strategies such as the beneficiary/polluter pays concept to encourage efficient water use.

#### *Science Leadership*

The federal government will provide scientific leadership among the provinces and private sector. It will:

- conduct and encourage the undertaking of physical, chemical, biological, and socio-economic investigations which are directed at current and emerging issues
- establish research advisory mechanisms with broad representation from scientific and applied research clientele to advise on program needs and priorities

- develop and maintain, with the provinces and territories, water data and information systems directed at improving the knowledge available for managing Canada's water resources.

  As part of this effort, Environment Canada maintains nation-wide networks for collecting hydrological and meteorological data. This includes monitoring at the sites used by the Prairie Provinces Water Board to administer the *Master Agreement on Apportionment.*

- promote cooperative federal-provincial endeavors when the objectives are of joint interest

- undertake and support research and technological development and the growth of a private sector water conservation industry

- encourage opportunities for non-governmental technological development and the growth of a private sector water conservation industry

- foster international cooperation in scientific and technological research and development, and in data and information collection systems.

### *Integrated Planning*

The federal government endorses an integrated approach to water resources planning. To promote integrated planning it will:

- adhere to integrated water resources planning in areas of federal jurisdiction and inter-jurisdictional waters subject to federal-provincial-territorial agreements in order to ensure that all values are given full consideration

- encourage, on the basis of a watershed or other appropriate spatial unit, the integration of water management plans and objectives with those of other natural resource interests – fisheries, forestry, wildlife, mining, hydro power, and agriculture – to reflect the unity of natural processes and the interdependence of uses and users in that spatial unit

- establish and apply evaluation criteria to all federally-sponsored projects to ensure their compatibility with federal goals respecting water management based on an appreciation of the values of water and related resources

- ensure that all significant national and international water-related development projects, which are supported or initiated by the federal government or for which federal property is required, are subject to the *Canadian Environmental Assessment Act* so that potential adverse environmental and socio-economic effects can be identified and, to the extent possible, mitigated
- ensure the participation or cooperation of all relevant coordinating and regulatory agencies
- encourage and support opportunities for public consultation and participation in the integrated planning process.

### *Legislation*

Water resources management in Canada is governed by both provincial and federal statutes. Provinces exercise proprietary rights over water resources and, therefore, have the authority to legislate on all aspects of water supply, use, pollution control, hydroelectric and non-nuclear power development, irrigation, and recreation. The statutes passed by Parliament on water and water-related activities relates to those activities over which the federal government has jurisdiction. The statutes deal with fisheries, the protection of navigable waters, shipping, some specific aspects of environmental protection, and drinking water in areas of federal jurisdiction, international water management, and federal-provincial-territorial cooperation in water resources planning and management.

To strengthen Canada's ability to deal with emerging issues in a remedial manner, the federal government will renew, consolidate, or otherwise strengthen the application of existing federal legislation so as to:

- produce legislative provisions to address inter-jurisdictional water issues relating to levels, flows, and quality
- control and manage toxic chemicals throughout their entire life cycle, from production to disposal
- establish water quality standards and guidelines to better protect human health and the diversity of species and ecosystems
- encourage existing mechanisms like the Prairie Provinces Water Board and develop others to address potential provincial-territorial and interprovincial water conflicts
- ensure the effectiveness of regulatory measures through the provision of appropriate enforcement and compliance measures.

### *Public Awareness*

In order to promote public awareness and participation in programs and initiatives to improve and protect Canada's water resources, the federal government will:

- ensure that the public is consulted and its views are considered in all major federal water management decisions
- encourage public participation and initiate, develop, and deliver a national water conservation awareness program
- encourage the efforts of provinces and non-governmental organizations in public information and awareness
- ensure public access to information on the extent and health of water resources through appropriate means including a state of the environment reporting system.

The policy is to be implemented at three levels.

1. At the federal level, the government will:
    - ensure the effective coordination of federal water policies among federal departments and agencies
    - ensure a regular review of the water-related policies and programs of all federal departments to assess the degree to which these policies and programs are supportive of federal water policy
    - reconcile the water policy positions of all federal departments to promote a coordinated and thoughtful federal approach
    - ensure amendments or additions to federal water policy as appropriate
    - apply the environmental assessment and review process to examine federally sponsored water-related developments and projects.
2. At the federal-provincial-territorial level, the adoption and application of policy goals and strategies will be encouraged through existing and improved federal-provincial coordinating mechanisms and bilateral arrangements which include:

- consultation and information exchange so as to encourage compatible water policies and cooperative programs through forums such as the Canadian Council of Ministers of the Environment (CCME)
- support for formal and informal consultative or advisory committees to deal with either a single issue or a range of water problems
- inter-governmental agreements for cooperative programs with all provinces and territories
- special agreements to respond to a particular water problem or issue in one or more of the provinces or territories.

3. At the international level, the policy will guide Canadian officials in their future bilateral and multilateral dealings with other national governments on water-related programs and activities.

## D.1.2 *Fish Habitat Management Policy*

### *Background and History*

The policy of Department of Fisheries and Oceans for the management of fish habitat is designed to achieve a net gain of habitat for Canada's fisheries resources. It provides objective statements against which Department of Fisheries and Oceans can measure its performance in fish habitat management and offers a framework for a more consistent administration of its habitat management program. This policy guides Department of Fisheries and Oceans in its administration of the habitat protection provisions of the *Fisheries Act*, including, inter alia, Sections 20, 30, 32, 35, and 36.

### *Basic Principles*

The objective of the *Fish Habitat Management Policy* is to achieve a net gain of habitat for Canada's fisheries resources: *increase the natural productive capacity of habitats for the nation's fisheries resources to benefit present and future generations of Canadians.*

This objective is supported by three goals covering the conservation, restoration, and development of fish habitat. Specifically, the three goals are:

1. **Fish Habitat Conservation** – Maintain the current productive capacity of fish habitats supporting Canada's fisheries resources such that fish suitable for human consumption may be produced. Fundamental to the goal of habitat conservation is the guiding principle of no net loss of the productive capacity of habitats.

2. **Fish Habitat Restoration** – Rehabilitate the productive capacity of fish habitats in selected areas where economic or social benefits can be achieved through the fisheries resource.

3. **Fish Habitat Development** – Improve and create fish habitats in selected areas where the production of fisheries resources can be increased for the social or economic benefit of Canadians.

The objectives and goals of the policy are outlined in Figure D.1.

### *Administration*

The fish habitat conservation goal is implemented through provisions of the *Fisheries Act* (e.g., Sections 35 and 37), which gives the Minister the authority to review, request additional information, and put conditions on developments that could affect fish habitat. The goal's implementation is outlined in Figure D.2.

The fish habitat development goal is to increase productive capacity of habitats by manipulating naturally occurring chemical, physical, and biological factors; and creating or providing access to new spawning, rearing, and food producing areas. This goal requires the continuing support of scientific research to discover and test new methods for increasing the productive capacity for fish habitat.

The policy is applied to all developments in Alberta that have the potential to impact fish habitat.

For further information contact:

Department of Fisheries and Oceans
7646 - 8 Street NE
Calgary, AB
T2E 8X4 Tel: (403) 292-5160

Figure D.1 Policy Framework For Fish Habitat Management

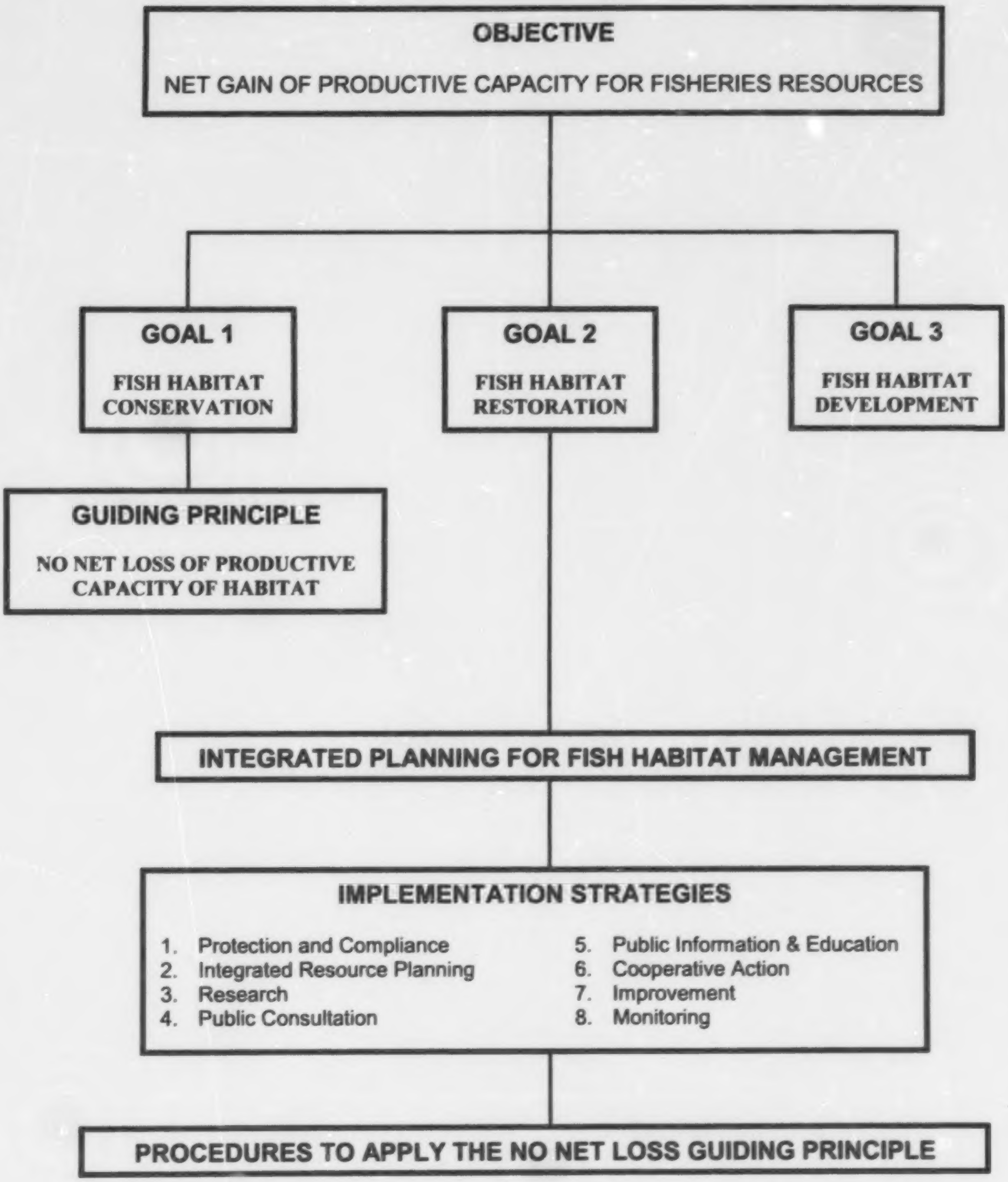
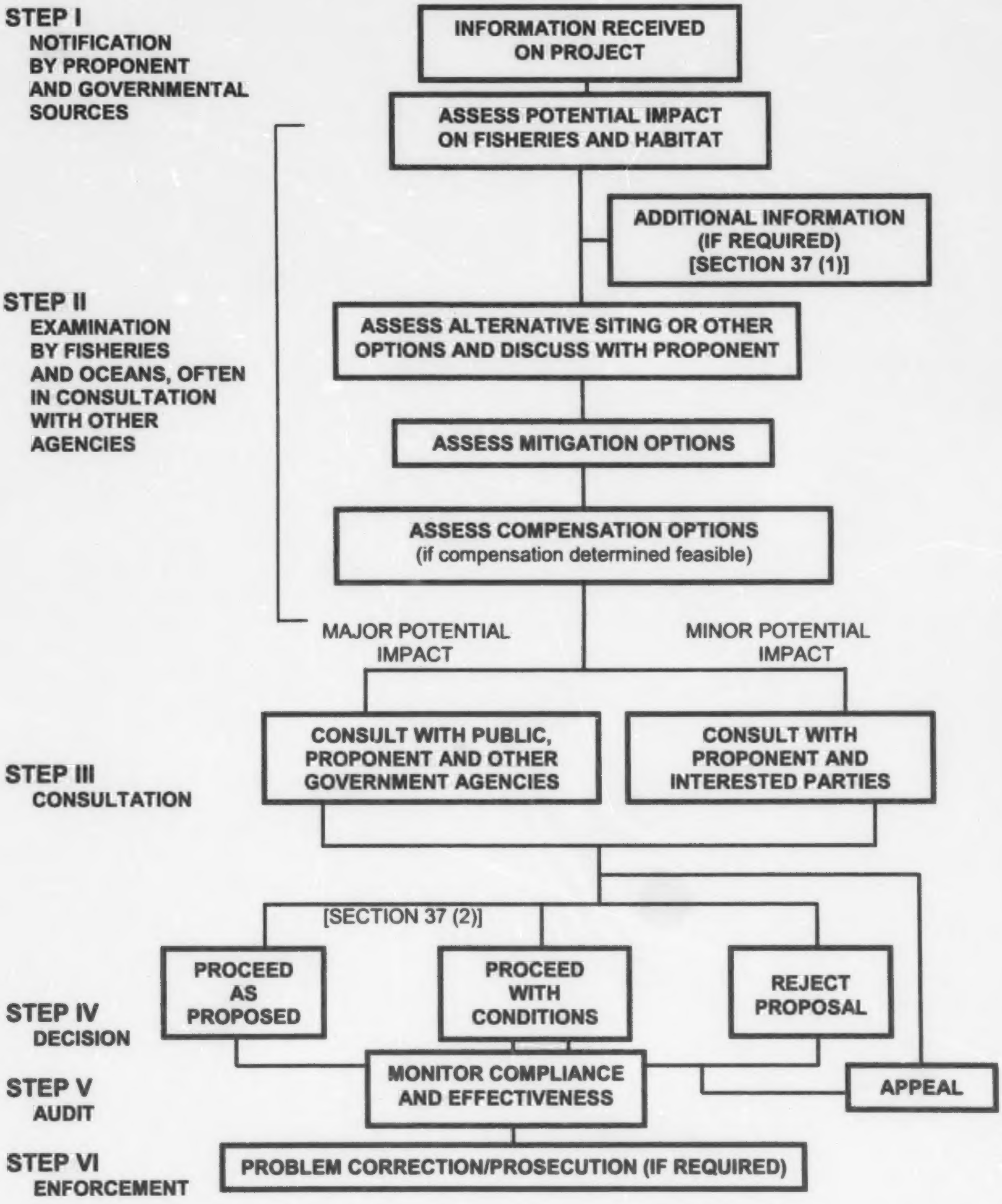

OBJECTIVE
NET GAIN OF PRODUCTIVE CAPACITY FOR FISHERIES RESOURCES
GOAL 1
FISH HABITAT CONSERVATION
GOAL 2
FISH HABITAT RESTORATION
GOAL 3
FISH HABITAT DEVELOPMENT
GUIDING PRINCIPLE
NO NET LOSS OF PRODUCTIVE CAPACITY OF HABITAT
INTEGRATED PLANNING FOR FISH HABITAT MANAGEMENT
IMPLEMENTATION STRATEGIES
1. Protection and Compliance
2. Integrated Resource Planning
3. Research
4. Public Consultation
5. Public Information & Education
6. Cooperative Action
7. Improvement
8. Monitoring
PROCEDURES TO APPLY THE NO NET LOSS GUIDING PRINCIPLE

**Figure D.2 Procedural Steps to Achieve No Net Loss**


STEP I
NOTIFICATION BY PROPONENT AND GOVERNMENTAL SOURCES
INFORMATION RECEIVED ON PROJECT
ASSESS POTENTIAL IMPACT ON FISHERIES AND HABITAT
ADDITIONAL INFORMATION (IF REQUIRED) [SECTION 37 (1)]
STEP II
EXAMINATION BY FISHERIES AND OCEANS, OFTEN IN CONSULTATION WITH OTHER AGENCIES
ASSESS ALTERNATIVE SITING OR OTHER OPTIONS AND DISCUSS WITH PROPONENT
ASSESS MITIGATION OPTIONS
ASSESS COMPENSATION OPTIONS (if compensation determined feasible)
MAJOR POTENTIAL IMPACT
MINOR POTENTIAL IMPACT
CONSULT WITH PUBLIC, PROPONENT AND OTHER GOVERNMENT AGENCIES
CONSULT WITH PROPONENT AND INTERESTED PARTIES
STEP III
CONSULTATION
[SECTION 37 (2)]
PROCEED AS PROPOSED
PROCEED WITH CONDITIONS
REJECT PROPOSAL
STEP IV
DECISION
MONITOR COMPLIANCE AND EFFECTIVENESS
APPEAL
STEP V
AUDIT
STEP VI
ENFORCEMENT
PROBLEM CORRECTION/PROSECUTION (IF REQUIRED)

## D.1.3 Wildlife Policy for Canada

This is a national policy that provides a framework for federal, provincial, territorial, and non-governmental policies and programs that affect wildlife. It was adopted by the Wildlife Ministers' Council of Canada in 1990. The policy was published by the Canadian Wildlife Service (CWS) on behalf of the Wildlife Ministers' Council of Canada.

In *A Wildlife Policy for Canada*, "wildlife" refers to all wild organisms and their habitats. Therefore, the policy includes many species covered by other policies and supports an ecosystem approach to conservation. The goal of the policy is to maintain and enhance the health and diversity of Canada's wildlife for its own sake and for the benefit of present and future generations of Canadians.

*A Wildlife Policy for Canada* is intended to complement other legislation and policies. Agencies and organizations responsible for freshwater, marine, or terrestrial resources are expected to extend their concern to conserving the biodiversity of the ecosystems involved. Based on this policy, the conservation of biodiversity in the Bow River Basin is a major management consideration.

The policy is not intended to alter the division of roles and responsibilities between federal and provincial or territorial governments. The preparation of implementation plans is the responsibility of federal, provincial, and territorial wildlife ministers. Review of implementation progress is to occur at the annual meetings of the Wildlife Ministers' Council of Canada.

*A Wildlife Policy for Canada* is available from provincial and territorial wildlife agencies or the head office of CWS (Environment Canada).

For further information, contact:

Canadian Wildlife Service
Environment Canada
Ottawa, Ontario
K1A 0H3

Tel: (819) 997-1095
Fax: (819) 997-2756
E-mail: cws-scf@ec.gc.ca

# D.2 Provincial Government

## MAJOR PROVINCIAL POLICIES

### D.2.1 Alberta's Commitment to Sustainable Resource and Environmental Management

**Background and History**

The Alberta Government has adopted an interdisciplinary and comprehensive approach to managing natural resources. This integrated resource management approach (also see section G.19) integrates decisions, legislation, policies, programs, and activities across resource sectors to gain the best overall long-term benefits for society and to minimize conflicts. The policies summarized in Sections D.2.1 through D.2.8 present significant integrated resource management policies at the provincial and regional levels. *Alberta's Commitment to Sustainable Resource and Environmental Management*, approved in March 1999, signifies a milestone in the implementation of integrated resource management in Alberta at the provincial level. This document provides the overall basis for the development of regional sustainable development strategies through the government's integrated resource management program.

**Basic Principles**

*Alberta's Commitment to Sustainable Resource and Environmental Management* is a document that reconfirms the Alberta Government's commitment to sustainable development and describes the government's approach to sustainable resource and environmental management. The approach involves four key requirements:

***A Shared Vision***

A vision of Alberta's sustainable development future was first articulated by Alberta's Round Table on the Economy and the Environment and adopted by a unanimous resolution of the Legislature in 1992. The vision holds that "Alberta, a member of the global community, is a leader in sustainable development, ensuring a healthy environment, a healthy economy, and a high quality of life in the present and future."

### *Provincial Direction*

Government departments, boards, and agencies, with responsibilities related to the economy, natural resources or the environment, are to acknowledge, pursue and reflect the sustainable development vision in their policies, legislation, programs, and day-to-day activities. Deputy Ministers will be held accountable for this integration through the Sustainable Development Coordinating Council (see section E.3.2). More specifically they are to ensure that:

- the use of Alberta's natural resources shall be sustainable
- the management of Alberta's natural resources shall support and promote the Alberta economy
- Alberta's environment shall be protected
- resources shall be managed on an integrated basis
- Alberta's natural resources shall be managed for multiple benefits.

### *Effective Decision Making*

The following directions will be pursued on a government-wide basis:

- province-wide initiatives shall be integrated
- natural resource and environmental management decisions shall be carried out on an integrated basis
- decisions shall be timely, responsive and provide for the early resolution of conflicts
- resource and environmental management decisions shall include consultation (e.g., input from those communities and industries that will be most directly affected by the decisions).

### *Up-to-Date Legislative/Regulatory Regime*

The following directions will be pursued on a government-wide basis:

- Alberta's policy and legislation shall continue to incorporate new and innovative approaches
- the types of resource and environmental regulation will be streamlined and simplified, and the amount will be reduced without reducing the levels of protection
- current policies, guidelines, standards, and other relevant guidance documents shall be reviewed
- the legislation and policies that govern resources and the environment shall be made readily accessible to industry, communities and the public
- compliance with Alberta's resource and environmental management requirements shall be assured.

### Administration

The document provides the umbrella direction that brings together various initiatives such as Special Places (see section G.25) and Water Management Policy and Legislation (see sections D and E).

### Influence on Water Management

*Alberta's Commitment to Sustainable Resource and Environmental Management* ensures that water will be available for (but will not limited to) drinking, recreation, irrigation, industry, and fish habitat.

The document also requires the integration of forest management plans and water management plans through the development of comprehensive integrated plans for major river basins in Alberta. These regional plans will provide a level of detail between provincial policy and operational decision making. They will also provide a context and process for stakeholder and government decisions.

### Who Could Be Affected

The *Commitment to Sustainable Resource and Environmental Management* may affect those who want access to water insofar as such access must be compatible with the principles contained in the *Commitment*. Others may be affected in terms of being consulted by the government on decisions relating to resources and environmental management.

For further information, contact:

Regional Environmental Coordinator
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-5647
Fax: (403) 297-6069

## D.2.2 Water Management – Vision and Principles

### Background and History

During the 1990s, Alberta Environment reviewed water management policies and legislation in a process that involved extensive public consultation. The goal was to establish a blueprint for the sustainable management of water in Alberta, including creation of the *Water Act*. The vision and principles for water management planning were developed as part of this process and are part of the *Framework for Water Management Planning* (released January 2002).

### *Basic Principles*

#### *Vision*

- *All Albertans are stewards of Alberta's water;*

- *Albertans act responsibly in managing and conserving water, to ensure the environmental, economic and social health of the province; and*

- *Albertans recognize the importance of living within the capacity of the natural environment as a means of ensuring the sustainability of water.*

#### *Principles*

- *Water must be managed sustainably.*
  - water must be managed and conserved to meet current and evolving needs without compromising the ability of future generations to meet their own needs.

- *Water is a vital component of the environment.*
  - water is recognized as one of Alberta's most important natural assets; and
  - the aquatic environment, including the diversity of aquatic life, must be protected.

- *Water plays an essential role in a prosperous economy and balanced economic development.*
  - water must be wisely allocated and efficiently used, and regulatory and administrative processes for managing water must be streamlined, user-friendly, and fair.

- *Water must be managed using an integrated approach with other natural resources.*
  - the interdependence of water quality and water quantity is recognized;
  - the interdependence of natural resources is recognized; and
  - water management is based on a watershed approach.

- *Water must be managed in consultation with the public.*
  - the public must be involved in water management and decision making;
  - information sharing and open communication must be provided for; and
  - opportunities for public education must be supported.

- *Water must be managed and conserved in a fair and efficient manner.*
  - water rights which existed under the *Water Resources Act* must be recognized;
  - enforcement action when required must be applied firmly, fairly and consistently;
  - water management must respond to differing local and regional needs; and
  - the Government of Alberta must work cooperatively with governments of other jurisdictions.

For further information, contact:

Ralph Schroth, Water Policy Coordinator
Alberta Environment
9th Floor, 9820 - 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-9287
Fax: (780) 422-0262

## D.2.3 The Framework for Water Management Planning

### Background

The *Framework for Water Management Planning* outlines the planning direction for water management throughout the province. It is intended to provide consistent direction, while at the same time allowing for enough flexibility to address different situations. It supports sustainable resource and environmental management, recognizes both short- and long-term needs and values for water, and considers local and regional perspectives.

Central to the *Framework* is the *Strategy for the Protection of the Aquatic Environment*. This Strategy affirms government's commitment to not only maintaining and restoring the aquatic ecosystem but also enhancing it.

### Basic Principles

*The Framework for Water Management Planning* has been designed to be consistent with *Alberta's Commitment to Sustainable Resource and Environmental Management* and with Integrated Resource Management principles. See section D.2.2 for the vision and principles that guided preparation of the Framework.

### Administration

The Framework outlines the process for water management planning and the components required for water management plans in the province. It applies to all types of water bodies, including streams, rivers, lakes, aquifers and wetlands. The Framework recognizes that no two situations are exactly alike and therefore is not intended to be a detailed user's manual on how to prepare water management plans. Rather, it is intended to provide general guidance for the planning process.

### Influence on Water Management

All water management planning must adhere to the vision, principles and other concepts provided in the Framework.

### Who Could Be Affected

A water management plan can be developed by anyone. However, any person developing a water management plan must follow the Framework.

For further information, contact:

Ralph Schroth, Water Policy Coordinator
Alberta Environment
9th Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6

Tel: (780) 427-9287
Fax: (780) 422-0262

# REGIONAL POLICIES

## D.2.4 *Eastern Slopes Policy*

This section summarizes the policy for resource management of the Eastern Slopes, as revised in 1984.

### *Background and History*

The Eastern Slopes of Alberta's Rocky Mountains cover an area of approximately 90,000 $km^2$ of mainly forest-covered mountains and foothills (see Map D.1). The region possesses a great wealth of renewable and non-renewable resources – water, scenery, timber, forage, wildlife, fisheries, and mineral resources – the majority of which lie upon or beneath public lands.

The resource base of the Eastern Slopes is not unlimited. Continuing increase in use of resources and land in the region have led to conflicts among users and to a rising concern for the protection of environmental quality and the management of this extremely important watershed region.

In 1973, extensive public hearings into all aspects of land use and resource development in the Eastern Slopes identified the need for integrated resource policies and land use planning for the area. Efforts to develop a policy and plan for the Eastern Slopes began in 1975 and led to the 1977 approval of *A Policy for Resource Management of the Eastern Slopes*. The policy was revised in 1984.

### *Basic Principles*

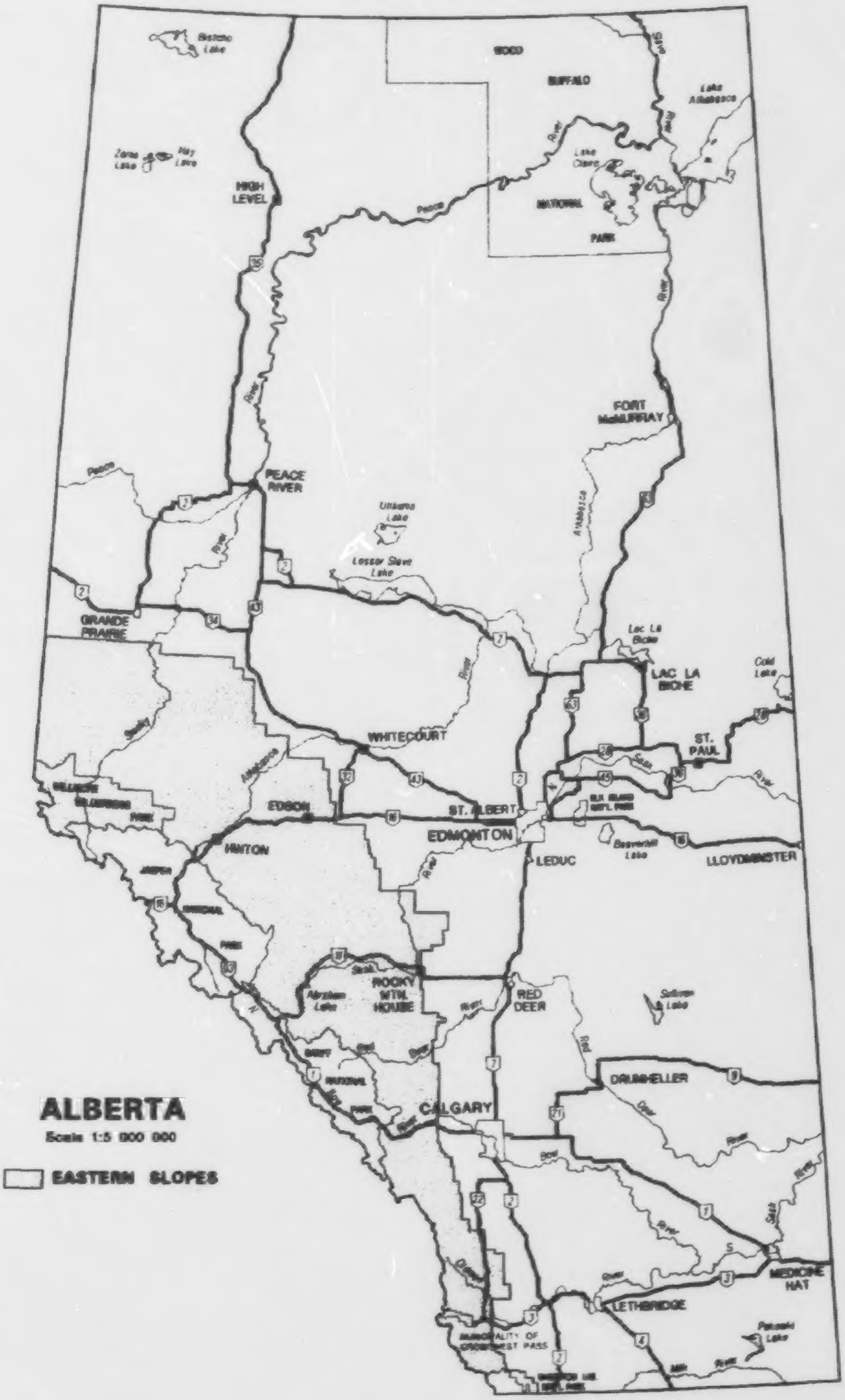
The policy is intended to reflect the realities of the economic situation in Alberta and to provide for the maximum delivery of the full range of values and opportunities in the region while ensuring sustainability of the resource.

The basic policy guidelines for the Eastern Slopes are:

- The highest priority in the overall management of the Eastern Slopes is placed on watershed management. Recreation and tourism benefits from the private and public sectors are also extremely important.

- The natural resources of the Eastern Slopes will be developed, managed and protected in a manner consistent with principles of conservation and environmental protection.

## Map D.1 Alberta Eastern Slopes


Bistcho Lake
WOOD
BUFFALO
NATIONAL
PARK
Lake Athabasca
Lake Claire
Zama Lake
Hay Lake
HIGH LEVEL
Peace
FORT McMURRAY
Athabasca
PEACE RIVER
Utikuma Lake
Lesser Slave Lake
GRANDE PRAIRIE
Lac La Biche
LAC LA BICHE
Cold Lake
ST. PAUL
WHITECOURT
EDSON
HINTON
ST. ALBERT
EDMONTON
LEDUC
Beaverhill Lake
LLOYDMINSTER
JASPER
NATIONAL
PARK
ROCKY MTN. HOUSE
Abraham Lake
RED DEER
Sullivan Lake
DRUMHELLER
BANFF
NATIONAL
PARK
CALGARY
MEDICINE HAT
LETHBRIDGE
MUNICIPALITY OF CROWSNEST PASS
Pakowki Lake
Milk River
ALBERTA
Scale 1:5 000 000
EASTERN SLOPES

- The uniqueness of the Eastern Slopes, due to its aesthetic qualities and combination of environments, will be maintained.
- The recreation resources of the mountains and foothills will be maintained while increasing the opportunities for Albertans to enjoy this unique region.
- The management of renewable resources is the long-term priority in the Eastern Slopes. Non-renewable resource developments will be encouraged in areas where this priority can be maintained.
- Decisions for development, management and protection of natural resources in the Eastern Slopes will be based on an integrated resource planning system.
- All levels of integrated resource planning will include a public involvement program.

### Administration

The *Eastern Slopes Policy* contains the Regional Plan for the Eastern Slopes. The Plan is an intermediate step between the *Eastern Slopes Policy* and the Integrated Resource Plans that provide more detailed and comprehensive land use allocations and guidelines.

The management intentions (protection, resource management, and development) and policy guidelines of the integrated resource plans (i.e., guidelines identifying the most important resource opportunities of the Eastern Slopes and the major priorities to be considered in management) are incorporated into the programs and other policies that provincial agencies use to manage Alberta's natural resources.

### Influence on Water Management

The *Eastern Slopes Policy* and integrated resource plans provide direction for the protection of the upper watershed of the Bow River Basin outside of Banff National Park and the use of provincially owned public land and resources within the upper watershed.

### Who Could Be Affected

The *Eastern Slopes Policy* and integrated resource plans must be complied with by anyone who wishes to use provincially owned public land and resources in the region. Other users of public land in the Eastern Slopes (e.g., existing lessees, recreationists) may also be directly affected by resource allocation decisions under the policy and integrated resource plans.

### Authority to Issue Approvals

The policy is a guide rather than a regulatory mechanism for the public, resource managers, and industry having responsibilities or interests in the area. It is sufficiently flexible so that all proposals for land use and development may be considered. No legitimate proposals will be categorically rejected. Should a proposal not be in keeping with the provisions of the policy, alternative means will be explored for accommodating the proposal in a more appropriate location.

For further information on the *Eastern Slopes Policy* and how it is being implemented in the Bow River Basin, contact:

Regional Environmental Coordinator
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-5647
Fax: (403) 297-6069

## D.2.5 Water Management Policy for the South Saskatchewan River Basin

### Background and History

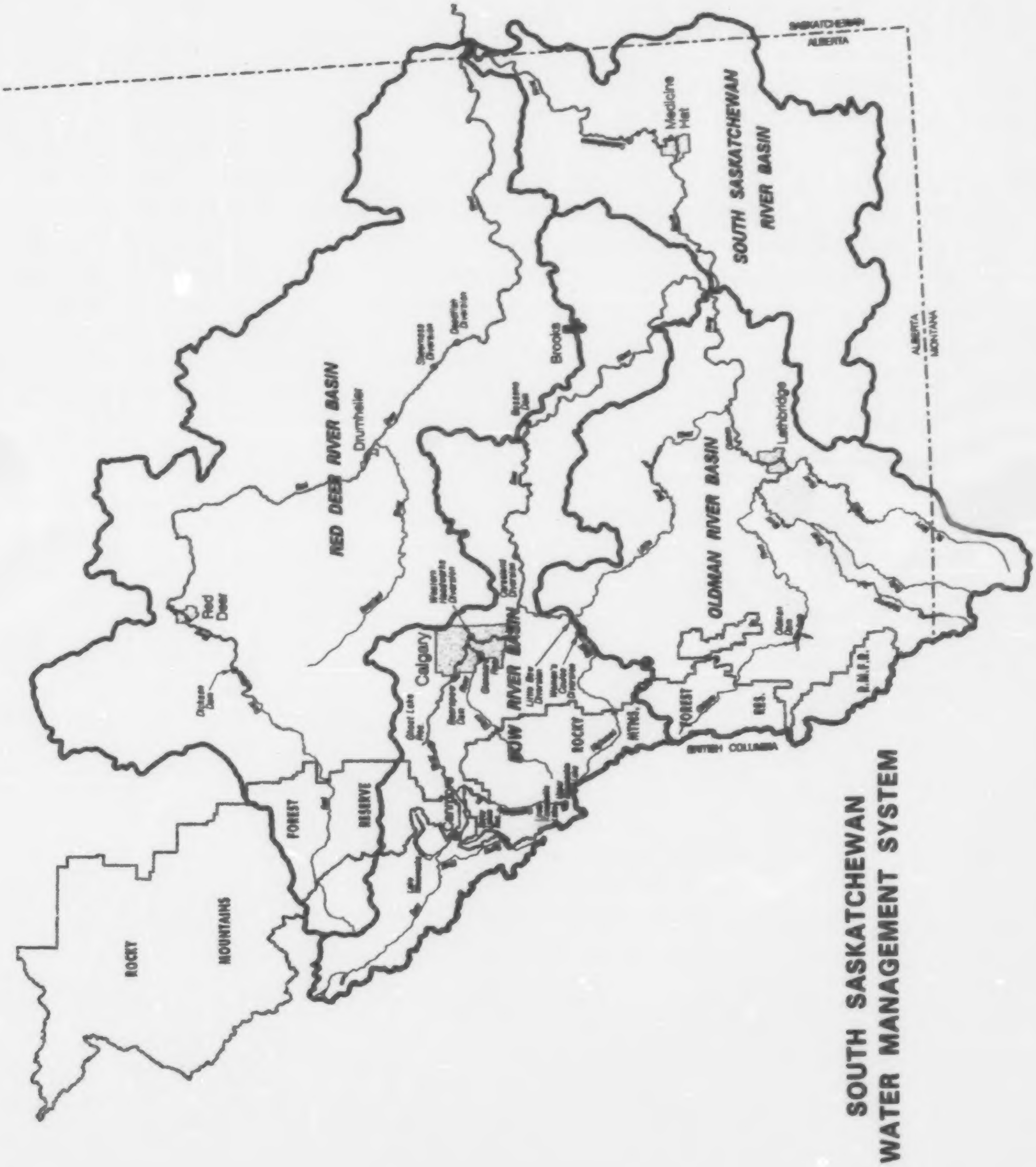
The South Saskatchewan River Basin (SSRB) (Map D.2) includes the Red Deer, Bow, Oldman and South Saskatchewan Rivers. In the early 1980s, Alberta Environment initiated a process to address a number of water use management issues in the SSRB. This process involved:

1. **The South Saskatchewan River Basin Planning Program** – Based on extensive public involvement, a series of scenarios for future water use and management were developed.

2. **Public Hearings** – In 1984, the Alberta Water Resources Commission (AWRC) held public hearings throughout the basin to obtain public input on water use management issues.

3. **AWRC Report and Recommendations** – In 1986, the AWRC released its report, which included 106 recommendations on water use management in the South Saskatchewan River Basin.

Map D.2 South Saskatchewan River Basin


SASKATCHEWAN
ALBERTA
Medicine Hat
SOUTH SASKATCHEWAN RIVER BASIN
Brooks
Lethbridge
ALBERTA
MONTANA
OLDMAN RIVER BASIN
RED DEER RIVER BASIN
Drumheller
Red Deer
Calgary
BOW RIVER BASIN
FOREST
RESERVE
ROCKY
MOUNTAINS
BRITISH COLUMBIA
SOUTH SASKATCHEWAN
WATER MANAGEMENT SYSTEM

In 1990, in response to the AWRC recommendations, the Alberta government released the *Water Management Policy for the South Saskatchewan River Basin.*

### Basic Principles

The main principles of the Policy are:

- **Multi-Purpose Use** – Multiple use will continue to be the principle governing the use and management of the waters in the SSRB.
- **Priority of Uses, Minimum Flows and Preferred Instream Flows** – Two levels of instream flow requirements will be established: "minimum" to protect basic water quality and instream needs and "preferred" to protect desirable instream needs. Existing water rights and their priority, as established by the date of application, will be respected.
- **Irrigation** – Maximum water allocation for irrigation purposes in the Red Deer, Bow, Oldman and South Saskatchewan basins have been established with consideration to requirements for all other uses.
- **Apportionment Commitments** - Alberta will continue to manage the waters of the Red Deer, Bow, Oldman and South Saskatchewan Rivers in concert to ensure that the province's interprovincial commitments under the *Master Agreement on Apportionment* are met and to best serve the needs of all water users in the basin.
- **Water Conservation** – Objectives and guidelines for water conservation and efficiency will be developed.
- **Public Consultation** – The government is committed to ensuring that Albertans have every opportunity to understand and provide advice on water management decisions.

### Administration

Instream needs are being established for the Bow, Elbow, Highwood, Kananaskis, Red Deer, Oldman, and South Saskatchewan Rivers.

Water licensing in the SSRB is governed by the *South Saskatchewan Basin Water Allocation Regulation*, which limits the amount of water that can be licenced for irrigation expansion.

For further information, contact:

Bob Morrison
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-6462
Fax: (403) 297-6069
E-mail: Robert.S.Morrison@gov.ab.ca

## OTHER PROVINCIAL POLICIES

### D.2.6 *Ground Water Allocation Policy for Oilfield Injection Purposes*

#### *Background and History*

Ground water use is licenced under the *Water Act*. In 1990, in response to a need to restrict ground water use in the White Area, the Minister of the Environment adopted a policy on the use of ground water for oilfield injection purposes.

#### *Basic Principles*

The purpose of this policy is to manage potable ground water to provide continuing protection to water users while maintaining multi-purpose use of water. This was established to substantially reduce the conflict over the use of potable ground water for oilfield injection in agricultural areas. The following are the main principles of the policy:

- **Quantity Limitations** – An applicant who proposes to use potable ground water for oilfield injection purposes will be restricted to a maximum of one-half of the long-term yield of an aquifer over the life of the project.
- **Time Limit Restriction** – All initial approvals for oilfield injection will be limited to a one-year time period. A five-year extension will be issued only if the aquifer is performing in accordance with the terms and conditions of approval and without unreasonable negative impact on other wells in the community. Future annual extensions will be granted for five-year time periods if the required conditions are met and no applications, which exceed the remaining available aquifer capacity, have been received from the surrounding community.
- **Monitoring Stations** – Ground water monitoring stations must be available for inspection by designated local officials and affected parties.

- **Surface Water, Non-Potable Ground Water, and Non-Water Alternatives** – A detailed examination into the use of surface water, non-potable ground water, and non-water alternatives will be investigated by the applicant, prior to the submission of an application to develop and use a potable ground water source for oilfield injection purposes.

- **Area of Applicability of the Policy** – The policy only applies to the White Area of the province.

### Administration

Alberta Environment is responsible for the ground water policy.

For further information, contact:

| | |
|---|---|
| Basin Evaluation and Policy Section | |
| Water Management Division | |
| Alberta Environment | |
| 9th Floor, 9820 – 106 Street | |
| Edmonton, AB | Tel: (780) 427-8985 |
| T5K 2J6 | Fax: (780) 427-0262 |

## D.2.7 *Wetland Management Interim Policy*

### Background and History

In response to the loss of wetlands (e.g., sloughs, marshes, bogs) and the need for consistent direction to guide provincial departments in wetland management, the Alberta Water Resources Commission (AWRC) received approval from Cabinet in June, 1990 to draft a policy for management of wetlands in the settled area of Alberta. To assist with the development of its recommendations, the AWRC released two documents: *Wetlands Values and Options: A Draft Policy for the Management of Wetlands in the Settled Area of Alberta* and *Wetland Management in the Settled Area of Alberta: Background for Policy Development.*

Extensive public consultations were held across Alberta in 1990 concerning the principles and strategies, which would form the basis of the wetland management policy. Public input was used to revise the draft policy, which was adopted as an interim policy in 1993.

During this time, a need was identified for a wetland policy for non-settled areas. The AWRC prepared a draft policy for discussion in 1994 that covered wetlands in the non-settled area.

### Basic Principles

The goal of the Government of Alberta is "to sustain the social, economic, and environmental benefits that functioning wetlands provide now and in the future."

The interim policy with the respect to slough/marsh wetlands is to:

- conserve slough/marsh wetlands in a natural state
- mitigate degradation or loss of slough/marsh wetland benefits as near to the site of disturbance as possible
- enhance, restore, or create slough/marsh wetlands in areas where they have been depleted or degraded.

The policy states that the overall goal applies to wetlands and that a cautious approach to the use and development of peat resources will be adopted until the comprehensive provincial policy is approved. Peatland acreage is very limited in the Bow River Basin.

The policy states that regional wetland management objectives will be developed with opportunities for public and local government input and that wetland management activities will be guided by the policy and the regional wetland management objectives.

### Administration

With the disbanding of the AWRC, Alberta Environment is the lead agency for the approval and implementation of the policy. The interim policy is being implemented regionally through the department. A wetland policy that covers both the settled and non-settled area of the province is currently being drafted. This new policy will eventually replace the interim policy.

The wetland policy for the settled area addresses a wide range of provincial government activities and activities of the federal government, local governments, and non-government organizations which impact wetlands. In addition to the principles outlined above, the policy includes the following implementation strategies:

- **Education** – Education is a key implementation activity in the policy, particularly as it applies to private land. Education about wetland functions, values and management topics has increased. Private stewardship of wetlands will be promoted. Educational packages for schools are available from Alberta Environment.

- **Wetland Ownership** – Protection of publicly owned wetlands is supported. Publicly owned wetlands should be maintained in public ownership.

- **Planning** – The wetland policy is being incorporated into existing planning programs. The public and municipal governments will be included in wetland management planning.

- **Drainage** – Drainage for agriculture has been a major cause of wetland loss. In the future, drainage of wetlands will be guided by the wetland management policy and regional wetland management objectives.

- **Incentives** – Incentives for wetland drainage will not be provided.

- **Surrounding Land and Wetland Margins** – Wetland margins are a valuable part of wetlands and should be conserved. Education programs will address the importance of private landowners protecting wetland margins.

- **Urban Wetlands** – Natural wetlands in an urban area can provide stormwater retention, water purification, and wildlife viewing opportunities. Retention of natural wetlands within urban areas will be encouraged.

- **Transportation, Utility and Energy Development** - Transportation, utility and energy developments have contributed to the loss of wetlands directly and through alteration of natural drainage patterns. Retention and reclamation of wetlands are being encouraged during these activities. Several good examples of the effects of the policy already exist.

- **Water Management** – Use of wetlands for purposes such as flood control, urban stormwater retention, water purification, flow regulation, and ground water recharge will be possible.

- **Wildlife Damage** – Compensation to agricultural producers for waterfowl crop damage will continue and programs that prevent or reduce crop damage will be supported.

- **Pollution and Degradation of Wetlands** – Control of regulated activities, including disposal of sewage in wetlands, will continue to ensure wetlands are protected. Education and planning are being used to reduce the negative effects on wetlands of non-regulated activities such as land clearing, livestock production, and application of pesticides.

- **Legislation** – The wetland management policy is being implemented under the authority of the *Water Act*, where necessary.
- **Inventory and Monitoring** – An inventory of wetlands to characterize the various regions in the settled area was completed. The Peat Task Force worked with the University of Alberta to inventory wetlands in the non-settled area.
- **Public Consultation** – Public consultation will be an integral part of wetland planning and management.
- **Municipal Governments** – Municipal governments will be involved in the planning and management of wetlands. They will be encouraged to implement the wetland policy through municipal programs and activities.
- **Cooperation and Communication** – Cooperation and communication among all levels of government, non-government organizations, industry, landowners, and other individuals regarding wetland management will be promoted.

Under the direction of the Wetlands Management Steering Committee several reports were published to help in decision making for the policy implementation. These include:

- *Characterization of Wetlands in the Settled Areas of Alberta*
- *On-Farm Water Management Study*
- *Functions and Values of Alberta's Wetlands*
- *Wetland Mitigation Processes of Selected North American Jurisdictions.*

For further information, contact:

Basin Evaluation and Policy Section
Water Management Division
Alberta Environment
9th Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-8985
Fax: (780) 427-0262

## D.2.8 *A Fish Conservation Strategy for Alberta, 2000-2005*

### *Background and History*

*A Fish Conservation Strategy for Alberta, 2000-2005,* is a public information document based on a staff publication of the same title (publication number I/640). Both versions are based on an earlier discussion paper, *A Fish Conservation Strategy for Alberta*, prepared in 1990, and its companion document, *The Fish and Fisheries of Alberta: Facts and Figures*.

### *Basic Principles*

The mission for fisheries management is to sustain the abundance, distribution and diversity of fish populations at the carrying capacity of their habitats. Biodiverse and productive ecosystems maintain healthy fish populations and support social and economic benefits for Albertans.

Three primary components are involved:

- **Habitat Maintenance** – sustain, or achieve a net gain in the quality and quantity of fish habitat.
- **Fish Conservation** – regulate fish harvest in line with, and not exceeding, the productive capacity of fish populations.
- **Fish-Use Allocation** – manage fish populations in a manner that meets the present expectations of Albertans without compromising the ability of future generations to meet their expectations.

The guiding principles in fisheries management are:

- no net loss of the productive capacity of habitats
- fish populations are to be maintained by natural reproduction wherever possible
- the biological diversity of fish fauna is to be maintained, and the depletion or extirpation of species, populations, sub-populations or unique strains must be avoided
- the management of fisheries will be conducted on the basis of fundamental ecological principles and factual information
- there should be public involvement and education in the fisheries management process
- the "user-pays" philosophy should augment the financing of the stewardship and management of fish resources

- public access to waters producing publicly-owned fish should be provided and maintained.

### Administration

Fish and Wildlife Division, Alberta Sustainable Resource Development is actively working to achieve the objectives, goals and mission of *A Fish Conservation Strategy for Alberta* through development and implementation of education programs, guidelines and procedures.

Formal legislative authority for management of fish habitat resides with the Minister, Department of Fisheries and Oceans.

### Influence on Water Management

*A Fish Conservation Strategy for Alberta* is a guide for the management of fish resources in the province. It reflects the Alberta Government's commitment to sustaining the quality of Alberta's fisheries and ensuring the provision of societal benefits now and for future generations

### Who Could Be Affected

*A Fish Conservation Strategy for Alberta* may affect those who wish to utilize the fish resource or carry out activities that may affect the fish resource insofar as such use and activities must be compatible with the principles contained in the Strategy (e.g., the Strategy indicates that proponents of development should determine the extent and type of fish use and habitat base at sites of proposed development and undertake appropriate habitat protection, mitigation and compensation measures). Others may be affected in terms of being consulted by the government on management objectives and issues relating to fisheries management.

For further information, contact:

Alberta Sustainable Resource Development
Area Offices:

- Canmore – Tel: (403) 678-5508
- Calgary – Tel: (403) 297-6423
- Brooks – Tel: (403) 362-1232

## D.3 Municipalities

### D.3.1 City of Calgary Water Management Policies

The water management policies of the City of Calgary are critical to the maintenance of a healthy ecosystem in the Bow River. City policies directly impacting water management in the Bow River are outlined below. In some cases, the City's policies are governed by provincial policies, laws, and regulations. These provincial institutional arrangements are noted where appropriate.

***Wastewater Management***

The City's wastewater management policies directly impacting the water quality of the Bow River are:

*Nose Creek*

Guidelines for stormwater discharge into Nose and West Nose Creeks were adopted in 1986. Development is restricted at or above the 1:100 year flood level and discharge rates are limited to 2.6 L/sec/gross ha of development. Ponds in these areas are constructed to provide storage volume for the 1:100 year flood and the permitted discharge rate.

*Bow River*

Stormwater cannot be discharged directly to the Bearspaw Reservoir and upstream of the reservoir. Previously, stormwater ponds had to intercept the flow and be capable of providing a 24-hour retention in a 1:10 year rainfall event. Newer ponds must provide water quality whereby a minimum removal of 80% of TSS (Total Suspended Solids) and a 24-hour minimum detention period is achieved.

*Elbow River*

The curtailment of new stormwater outfalls discharging directly to the Glenmore Reservoir and upstream of the reservoir was adopted by City Council in 1986. To protect drinking water, a project has been completed to intercept stormwater flow and spills on the Glenmore Trail causeway and discharge the water downstream of the reservoir. Ponds are constructed to provide water quality.

*Fish Creek*

The establishment of Fish Creek Park brought about the curtailment of new storm outfalls in the park. However, the province has since relaxed the restriction and adopted a policy of acceptance subject to rigorous environmental controls and site-specific necessity.

All stormwater ponds must provide:

- 1:100 year storage volume
- 80% removal of TSS
- 24-hour detention time

This information can be found in the document *Stormwater Management and Design Manual (2000)* available on the Internet at:

www.gov.calgary.ab.ca/wwd/OnLineManuals.html

A water quality assessment program is being conducted to establish "Total Loading" of treated sewage effluent, stormwater drainage, and surface water runoff to the Bow River. The assessment is to be completed by 2003. Through monitoring and modeling, the assessment will establish a benchmark for the quantity for four parameters (TSS, TP, ammonia nitrogen, and CBOD) entering the Bow River, which affect its water quality and, in turn, the total ecosystem.

The City of Calgary has in place a practice of stormwater outfall inspection on the Bow River, Elbow River and Nose Creek. Weirs have been installed in the outfalls to collect floatables (oil, grease, gasoline, etc.). These collection basins are pumped on a scheduled basis.

### *Wastewater Treatment Plants*

The standards for water quality treatment by wastewater treatment plants are controlled through the *Environmental Protection and Enhancement Act* and by regulations under that Act.

Regulation of discharge into the collection system is controlled through the *Sewer Service Bylaw*. The intent of the bylaw is to control sewage strength and protect against the discharge of prohibited materials.

### *Disposal of Sludge from Treatment Plants*

The application of municipal sludge (now called 'biosolids' to reflect the biological origin of the material) to farmland is a program adopted by the City in 1975 and is regulated by the provincial government and adheres to the provincial *Guidelines for the Application of Municipal Sludges*. The Guidelines pertain to rates of application as they relate to nutrients and metals. One application of biosolids often provides sufficient fertilizer value for two or more crop years. Tests are conducted to check nutrients that have been depleted before a re-application is undertaken. Care is also taken to ensure metals do not build up to a point where they would pose a danger to health. Calgary is fortunate to have very low metal levels in its biosolids due to limited heavy industry and stringent source control programs.

Sludge from water treatment plants (Glenmore and Bearspaw) is also treated to meet environmental standards. Various disposal methods have been employed involving land farming and land filling. The current practice is to lagoon the sludge for freeze-thaw treatment and disposal of the dried cake in the municipal landfill site. In addition, backwash water and plant leakage is de-chlorinated before it is discharged to the Elbow River.

### *Water Conservation*

The City of Calgary has a water meter incentive program that promotes water conservation through the installation of meters in new housing development. The success of the program and supporting water efficiency activities has resulted in the percentage of metered customers increasing from 22% in 1991 to 56% in 2000.

### *Erosion*

Riverbank stabilization is carried out on city-owned lands on an "as required" basis and is cost-shared with the Province paying 65% of the cost. Private lands are not included in this policy.

*Guidelines for Erosion & Sediment Control* is a policy directed at land development. One of the objectives is to control sediment loading into receiving bodies. The purpose of these guidelines is to provide developers and consulting engineers with a practical method of ensuring that urban construction is carried out in a manner that will keep soil erosion to a minimum level. Specific requirements relating to this fall under the "permit" requirements for development of land.

The *Drainage Bylaw* also prohibits sediment-laden water entry into the storm sewer collection system. Pumped stormwater must be filtered prior to allowing it into the storm system. A drainage permit is required.

*Flood Control*

The City of Calgary has undertaken extensive floodplain mapping of the Bow and Elbow Rivers within the city and has used that mapping as one of the tools in developing an emergency flood plan procedure.

For further information, contact

**Wastewater treatment**:

Plant Engineer
Wastewater Treatment Plants
City of Calgary Tel: (403) 268-3855

**Waterworks**:

Production Engineer
Water Treatment Plants
City of Calgary Tel: (403) 287-5111

## D.3.2 *Land Use Policies, Municipal Government Act*

The provincial government has established *Land Use Policies* under section 622 of the *Municipal Government Act*. Under this section, municipal plans, bylaws and planning decisions must be consistent with the *Land Use Policies*.

Each municipality is expected to incorporate the *Land Use Policies* into its planning documents and planning practices. Municipal statutory plans, land use bylaws, and planning decisions and actions must be consistent with the *Land Use Policies*.

Each municipality has the responsibility to interpret and apply the *Land Use Policies* and to further elaborate on the policy initiatives in its statutory plans and land use bylaws. Municipalities and provincial departments and agencies are encouraged to consult with one another where questions on the spirit and intent of these policies arise during implementation.

The policies that are directly relevant to water and other related natural resources are:

### *Planning Cooperation*

- Municipalities are encouraged to expand intermunicipal planning efforts to address common planning issues, especially where valued natural features are of interest to more than one municipality and where the possible effect of development transcends municipal boundaries.

- Municipalities are also encouraged to pursue joint use agreements, regional service commissions, and any other joint cooperative arrangements that which can contribute to such intermunicipal land use planning.

- Where two or more municipalities are located on the shores of the same lake and development is anticipated, the municipalities are encouraged to prepare, adopt, and implement an intermunicipal development plan to jointly address lake planning issues.

- Municipalities are encouraged to coordinate their planning activities and development approval process with provincial resource and land management policies, such as integrated resource plans.

- Municipalities are encouraged to work directly with provincial land and resource management agencies in the development of plans and policies on issues of mutual interest.

- Municipalities are encouraged to coordinate their planning activities with those of First Nation Reserves, Metis Settlements, Irrigation Districts, and appropriate federal departments and agencies where issues are of mutual interest.

### *Land Use Patterns*

- Municipalities are encouraged to establish land use patterns that embody the principles of sustainable development, thereby contributing to a healthy environment, a healthy economy, and a high quality of life.

- Municipalities are encouraged to establish land use patterns commensurate with the level of infrastructure and services that can be provided, regardless of whether the infrastructure and services are provided municipally, communally, individually, or by a utility company. Municipalities are encouraged to coordinate the provision of infrastructure and services with neighbouring municipalities.

***The Natural Environment***

- Municipalities are encouraged to identify, in consultation with Alberta Environment, significant ravines, valleys, stream corridors, lakeshores, wetlands and any other unique landscape area, and to establish land use patterns in the vicinity of these features, having regard to their value to the municipality and to the Province.

  If subdivision and development is to be approved in these areas, municipalities are encouraged to utilize, within the scope of their jurisdiction, mitigative measures designed to minimize possible negative impacts.

- Municipalities are encouraged to identify, in consultation with Alberta Environment, areas which are prone to flooding, erosion, landslides, subsidence, or wildfires and to establish appropriate land use patterns within and adjacent to these areas.

  If subdivision and development is to be approved in these areas, municipalities are encouraged to, within the scope of their jurisdiction, utilize mitigative measures to minimize the risk to health, safety, and loss due to property damage.

- Municipalities are encouraged to identify, in consultation with Alberta Environment, areas of significant fish, wildlife and plant habitat and to establish appropriate land use patterns designed to minimize the loss of valued habitat within and adjacent to these areas.

  If subdivision and development is to be approved in these areas, municipalities are encouraged to utilize, within the scope of their jurisdiction, mitigative measures to minimize the loss of habitat.

***Water Resources***

- Municipalities are encouraged to identify, in consultation with Alberta Environment, significant water resources within their boundaries.

- Municipalities are encouraged to determine appropriate land use patterns in the vicinity of significant water resources having regard to impacts on an entire watershed as well as local impacts.

- If subdivision and development is to be approved in the vicinity of significant water resources, municipalities are encouraged to implement, within the scope of their jurisdiction, measures that minimize or mitigate any negative impacts on water quality, flow and supply deterioration, soil erosion, and ground water quality and availability. Municipalities are also encouraged to facilitate public access and enjoyment of these water features, and to protect sensitive fisheries habitat and other aquatic resources.

For further information, contact:

Municipal Services Branch
Local Government Services Division
Alberta Municipal Affairs
17th Floor, 10155 – 102 Street
Edmonton, AB
T5J 4L4

Tel: (780) 427-2225
Fax: (780) 420-1016

# E. Laws and Regulations

## E.1 Legislation (Summary)

Figure E.1 outlines the key legislation that affects water management in the Bow River Basin. The diagram is intended for general information purposes only. The actual legislation should be consulted for all purposes of interpreting and applying the law. In addition, the individual agencies responsible for administering specific legislation should be contacted.

The main categories of information within Figure E.1 are:

- **Administration** – federal or provincial minister responsible
- **General Purpose** – how the act is used
- **Effects on Water Users** – how the legislation affects the water users of the basin and what user groups are potentially affected.

More detailed summaries of the legislation follow the diagram.

NOTE: The term *water management* includes a wide variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

Copies of the laws described here can be obtained from:

**Federal legislation**

Audrey's Books Ltd.
10702 Jasper Avenue
Edmonton, AB
T5J 3J5

Tel: (780) 423-3487
Toll free: 1-800-661-3649
Fax: (780) 425-8446
E-mail: audrey@audreysbooks.com

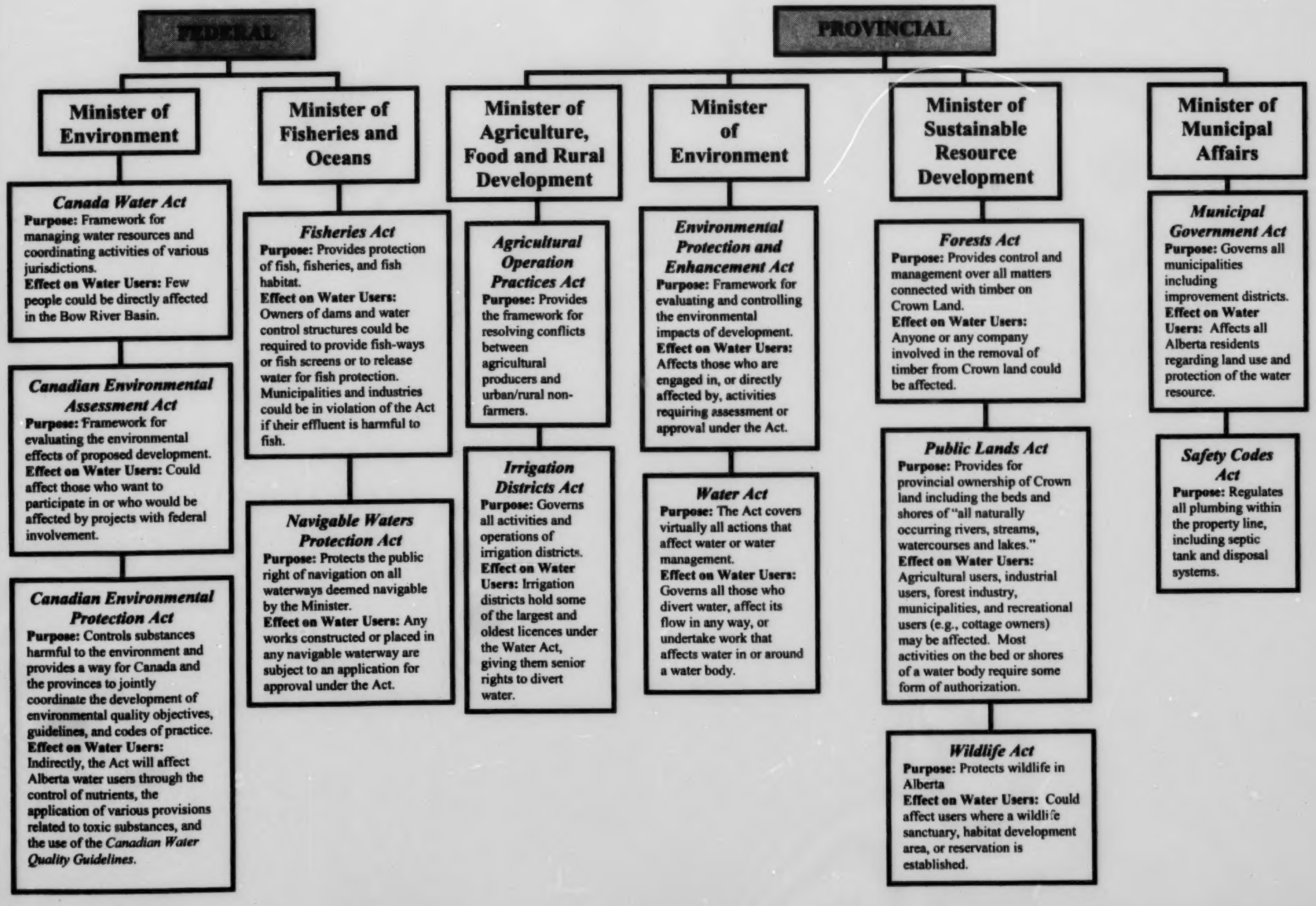
Or call the Canadian Government Publishing Sales Desk at:
1-800-661-3649

**Provincial legislation**

Queen's Printer Bookstore
Main Floor, McDougall Centre
455-6 Street SW
Calgary, AB
T2P 4E8

Tel: (403) 297-6251
Fax: (403) 297-8450
Internet: www.qp.gov.ab.ca/display_ acts.cfm

Figure E.1 Legislation that Affects Water Management in the Bow River Basin



**FEDERAL**

**Minister of Environment**

*Canada Water Act*
**Purpose:** Framework for managing water resources and coordinating activities of various jurisdictions.
**Effect on Water Users:** Few people could be directly affected in the Bow River Basin.

*Canadian Environmental Assessment Act*
**Purpose:** Framework for evaluating the environmental effects of proposed development.
**Effect on Water Users:** Could affect those who want to participate in or who would be affected by projects with federal involvement.

*Canadian Environmental Protection Act*
**Purpose:** Controls substances harmful to the environment and provides a way for Canada and the provinces to jointly coordinate the development of environmental quality objectives, guidelines, and codes of practice.
**Effect on Water Users:** Indirectly, the Act will affect Alberta water users through the control of nutrients, the application of various provisions related to toxic substances, and the use of the *Canadian Water Quality Guidelines*.

**Minister of Fisheries and Oceans**

*Fisheries Act*
**Purpose:** Provides protection of fish, fisheries, and fish habitat.
**Effect on Water Users:** Owners of dams and water control structures could be required to provide fish-ways or fish screens or to release water for fish protection. Municipalities and industries could be in violation of the Act if their effluent is harmful to fish.

*Navigable Waters Protection Act*
**Purpose:** Protects the public right of navigation on all waterways deemed navigable by the Minister.
**Effect on Water Users:** Any works constructed or placed in any navigable waterway are subject to an application for approval under the Act.

**PROVINCIAL**

**Minister of Agriculture, Food and Rural Development**

*Agricultural Operation Practices Act*
**Purpose:** Provides the framework for resolving conflicts between agricultural producers and urban/rural non-farmers.

*Irrigation Districts Act*
**Purpose:** Governs all activities and operations of irrigation districts.
**Effect on Water Users:** Irrigation districts hold some of the largest and oldest licences under the Water Act, giving them senior rights to divert water.

**Minister of Environment**

*Environmental Protection and Enhancement Act*
**Purpose:** Framework for evaluating and controlling the environmental impacts of development.
**Effect on Water Users:** Affects those who are engaged in, or directly affected by, activities requiring assessment or approval under the Act.

*Water Act*
**Purpose:** The Act covers virtually all actions that affect water or water management.
**Effect on Water Users:** Governs all those who divert water, affect its flow in any way, or undertake work that affects water in or around a water body.

**Minister of Sustainable Resource Development**

*Forests Act*
**Purpose:** Provides control and management over all matters connected with timber on Crown Land.
**Effect on Water Users:** Anyone or any company involved in the removal of timber from Crown land could be affected.

*Public Lands Act*
**Purpose:** Provides for provincial ownership of Crown land including the beds and shores of "all naturally occurring rivers, streams, watercourses and lakes."
**Effect on Water Users:** Agricultural users, industrial users, forest industry, municipalities, and recreational users (e.g., cottage owners) may be affected. Most activities on the bed or shores of a water body require some form of authorization.

*Wildlife Act*
**Purpose:** Protects wildlife in Alberta
**Effect on Water Users:** Could affect users where a wildlife sanctuary, habitat development area, or reservation is established.

**Minister of Municipal Affairs**

*Municipal Government Act*
**Purpose:** Governs all municipalities including improvement districts.
**Effect on Water Users:** Affects all Alberta residents regarding land use and protection of the water resource.

*Safety Codes Act*
**Purpose:** Regulates all plumbing within the property line, including septic tank and disposal systems.

## E.2 Federal Government

### E.2.1 *Canada Water Act*

R.S. 1985, c. 11

**NOTE**

**Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation and regulations should be consulted for all purposes of interpreting and applying the law.**

### *Background and History*

The concern about water pollution in the late 1960s led the Government of Canada to develop several acts directed toward the environment. One of those acts was the *Canada Water Act*. The Act was intended to provide a framework upon which to manage the water resources of the country and to coordinate the activities of the various jurisdictions. Over the years, the prime use of the Act has been the funding and development of river basin studies under Part 1 and the management of interprovincial and international water resources through such bodies as the Prairie Provinces Water Board and Mackenzie River Basin Board.

### *Basic Principles*

Part 1 of the Act provides for federal-provincial agreements relating to water resource management and comprehensive water resource management programs. These agreements can relate to maintenance of inventories, data collection, research, development of water resource management plans, and the implementation of the plans. There is also a provision for the federal government and the province to include cost-sharing arrangements under these agreements.

Part 1, Section 6 provides for the Minister to undertake any studies directly (with the approval of the Governor-in-Council) if (a) the Minister feels the matter is of "significant national interest" and (b) the Minister has shown that all negotiations for joint studies have failed.

Part 2 of the Act, which has never been used, provides for the Minister to enter into agreements with the provinces on the establishment of water quality management areas and water quality management agencies for (i) any federal waters or (ii) any waters, other than federal waters, the water quality management of which has become a matter of "urgent national concern."

The water management agencies would have the power to recommend water quality standards, treatment facilities that are necessary to meet the standards, and waste sample analysis methods. The agencies would also undertake studies on the quantities and kinds of waste present.

Water quality management plans would be developed by the agencies. The Governor-in-Council may also make regulations supporting the water quality management plans developed.

Part 2 also contains a general prohibition against the disposal of waste in any "water quality management area" unless in compliance with the regulations.

The Minister can provide the agencies with staff to carry out their functions.

Part 4 permits the Minister, either directly or in cooperation with any government, institution, or person, to undertake public information programs.

### *Administration*

The Act is administered by the federal Minister of the Environment. The Minister may appoint analysts and inspectors to assist with the administration and enforcement of the Act.

### *Influence on Water Management*

The most significant implication of the Act on water management is the funding of river basin boards, data collection agreements, river basin studies, and the implementation of study recommendations. This is generally handled under cost-sharing between the province(s) and the federal government.

Although the Act has provisions for the establishment of water quality management areas and the creation of agencies to manage these areas, no use has been made of these provisions.

### *Who Could Be Affected*

Few user groups would be directly affected by the Act in the Bow River Basin.

### Authority to Issue Approvals

There are no provisions in the Act for issuing permits or other types of approvals.

### Enforcement Procedures

Under the Act, it is an offence to deposit waste in a water quality management area. The fine for this offence is a maximum of $5,000 per offence.

## E.2.2 Canadian Environmental Assessment Act

SC 1992, c. 37

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### Background and History

The Act makes environmental assessment an integral part of federal government decision making. It is one of the methods of achieving sustainable development. The Act is the result of a seven-year public consultation process. The Act replaced the 1984 *Environmental Assessment and Review Process Guidelines Order*.

### Basic Principles

Under the Act, an environmental assessment[1] is required before a "federal authority" (e.g., federal minister, agency, department):

- carries out a project
- provides financial assistance to enable a project to be carried out (except non-project specific relief from federal taxes or duties)
- sells, leases, or otherwise transfers control or administration of federal land to enable a project to be carried out

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[1] In respect of a project, "environmental assessment" means an assessment of the environmental effects of the project that is conducted in accordance with the Act and regulations. "Environmental effects" means any change the project may cause in the environment and any change to the project that may be caused by the environment.

- as prescribed in the *Law List Regulations* (SOR/94-636), issues a permit, licence, approval, or takes an action that enables the project to proceed.

A federal authority that would fill any of these roles is responsible for conducting the environmental assessment.

An environmental assessment is required before the Governor-in-Council (federal Cabinet), as prescribed in the *Law List Regulations*,

- issues a permit, licence, approval, or takes other action that enables the project to proceed. The assessment is to be done by the federal authority recommending the action.
- sells, leases, or otherwise transfers control or administration of federal land to enable a project to be carried out
- provides federal financial assistance for a project.

An environmental assessment is also required before:

- a Crown corporation or a harbour commission can carry out a project. The assessment is carried out by the Crown Corporation or harbour commission in accordance with any regulations made for that purpose.
- federal financial assistance is provided for a project on First Nation land. The assessment is to be done by the band council in accordance with any regulations made for that purpose.

Environmental assessments can be required by the Minister where a project is not covered by the Act (i.e., no federal involvement) if the project has the potential to cause significant adverse effects in another province, outside Canada, or on lands in respect of which First Nations have interests (e.g., band land, prescribed land claims agreements).

The environmental assessment must be done as early as practicable in the planning process and before irrevocable decisions are made.

Some projects are excluded from the environmental assessment process. [See the *Exclusion List Regulations* (SOR/94-639)]. Some physical activities, not related to physical works, are also subject to the environmental assessment process. [See the *Inclusion List Regulations* (SOR/99-436)].

The Minister may enter into agreements with provinces on coordination, consultation, exchange of information, and determination of factors to be considered in relation to assessment of the environmental effects of projects of common interest. On June 24, 1999, the Government of Canada and the Government of Alberta signed the *Canada-Alberta Agreement for Environmental Assessment Cooperation*. This agreement allows the two governments to cooperate and coordinate so that their processes for environmental assessment are effective and consistent and avoid uncertainty and duplication.

### Administration

The Act is administered by the federal Minister of the Environment. The Act creates the Canadian Environmental Assessment Agency to:

- administer the environmental assessment process under the Act
- promote uniformity and harmonization in the assessment of environmental effects
- promote or conduct research in matters of environmental assessment
- encourage development of environmental assessment techniques
- promote environmental assessment in a manner consistent with the Act
- ensure an opportunity for public participation in the environmental assessment process
- provide administrative support for mediators and review panels
- provide information or training to facilitate the conduct of environmental assessments.

### Levels of Assessment

For some projects, a comprehensive study of environmental effects is mandatory. [See the *Comprehensive Study List Regulations* (SOR/94-638).] Some projects are excluded from the environmental assessment process. For other projects, a screening study is required. A "class screening report" can be used in conducting screenings of other projects within the same class.

Among the projects for which a comprehensive study is mandatory are:

- a dam or dyke that would:
  - for a natural water body, increase the annual mean surface area by 1,500 hectares or
  - for an existing reservoir, increase the surface area by more than 35%
- a diversion structure that would:
  - divert 10 million $m^3$/yr. of water or
  - increase diversion capacity by more than 35%
- a facility that would:
  - extract 200,000 $m^3$/yr. of ground water or
  - increase ground water production capacity by more than 35%

Projects may be referred to a mediator or a review panel if public concerns warrant, the significance of impacts is uncertain, or there are likely to be significant adverse effects. In some cases, the Minister may use appropriate alternatives to a review panel if the environmental assessment process will be similar to what is provided in the Act.

A screening study, comprehensive study, mediation, or assessment by a review panel must consider:

- environmental effects, including cumulative effects
- the significance of the effects
- comments from the public
- technically and economically feasible measures for mitigating significant adverse effects
- other relevant matters.

A comprehensive study, mediation, or assessment by a review panel must also consider:

- the purpose of the project
- technically and economically feasible alternatives to the project and their environmental effects
- the need for and requirements of a follow-up program
- the capacity of significantly affected renewable resources to meet the needs of the present and future.

### *Influence on Water Management*

The Act provides a framework that, on a project-specific basis, will evaluate the environmental effects of a proposed development on water quantity and quality and related land uses.

### *Who Could Be Affected*

The Act could affect those who propose, want to participate in, or would be affected by projects with federal involvement, whether the federal involvement is in support of the project or involves regulatory oversight.

One of the purposes of the Act is to ensure that there is an opportunity for public participation in the environmental assessment process. Every screening or comprehensive study must include consideration of comments from the public received in accordance with the Act and its regulations. A federal review panel must:

- ensure that the information required for its assessment is made available to the public

- hold hearings in a manner that offers the public an opportunity to participate in the assessment
- include in its report a summary of any comments received from the public
- hold hearings in public unless a witness would be harmed by public testimony.

In some other situations,[2] the environmental assessment process must:

- ensure that the public will be given an opportunity to participate in the assessment
- result in a published report.

Public notice is required in a number of situations. The more significant situations where public notice is required are:

- when public participation in the screening of a project is considered to be appropriate by the responsible authority
- prior to declaring that a screening report can be used as a class screening report, i.e., a screening report for projects within the same class
- when a comprehensive study report or a report of a mediator or review panel is available
- when a federal authority decides that it will not be involved in a project because the project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances
- when draft versions have been prepared of guidelines, codes of practice, some agreements and arrangements, and criteria for mediators, members of review panels, and substitute or alternative assessment processes.

All reports, agreements for joint review panels, guidelines, codes of practice, etc. are public documents.

Following a screening or comprehensive study report, a project may become the subject of a referral to a mediator or a review panel if the Minister is of the opinion that public concerns warrant such action.

A public registry is to be maintained for each environmental assessment conducted under the Act. This registry includes reports, public comments, records related to environmental assessment, and mediation or review panel terms of reference.

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[2] These situations are: i) a joint review panel with another jurisdiction, ii) a process that is substituted for a review panel, and iii) a mediator or review panel considering projects with no federal involvement but interprovincial or international implications.

To promote convenient public access to the registry, the Canadian Environmental Assessment Agency has developed the Federal Environmental Assessment Index. The index is available on the Agency's website at http://www.ceaa-acee.gc.ca

### Authority to Issue Approvals

If a project is subject to the Act, federal authorities are prohibited from acting in such a way as to enable the project to proceed until the environmental assessment process has been completed.

Table E.1 shows the different courses of action that can be followed in the environmental assessment process.

For more information, contact:

Canadian Environmental Assessment Agency
Suite 100, Revillon Building
10237 – 104 Street NW
Edmonton, AB
T5J 1B1

Tel: (780) 422-1410
Fax: (780) 422-6202
E- mail: CEAA.Alberta@ceaa.gc.ca

**Table E.1 Actions Related to Environmental Assessment**
***Canadian Environmental Assessment Act***

| Situation | Action of Responsible Authority |
|---|---|
| The project is not likely to cause significant adverse environmental effects. | Proceed with exercising power, duty, or function. Ensure that appropriate mitigation measures are implemented. |
| The project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances. | Do not exercise power, duty, or function. |
| It is uncertain that the project is likely to cause significant adverse environmental effects. | After screening<br>Refer the project to the Minister for a referral to a mediator or review panel<br>After comprehensive study<br>Following public review of the study, refer the project to a mediator or review panel. |
| The Minister is of the opinion that a project may cause significant adverse environmental effects. | Proceed with normal environmental assessment process<br>or<br>Consult with responsible jurisdiction and authority and refer the project to a mediator or review panel |

## E.2.3 Canadian Environmental Protection Act

SC 1999, c. 33

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### Background and History

The *Canadian Environmental Protection Act* was developed to bring a number of pieces of environmental legislation under one act and to provide a comprehensive law for the protection of the environment and human health.[3] In addition, it enabled the Government of Canada and the provinces to jointly coordinate the development of environmental quality objectives, guidelines, and codes of practice.

### Basic Principles

The principles of the Act related to water management are:

- a federal-provincial framework for:
  - national and cooperative action in matters affecting the environment
  - reduction in conflict between and duplication in regulatory activity
- environmental quality guidelines, objectives, codes of practice, monitoring, research, and information dissemination, including a state-of-the-environment report by the federal government
- control of toxic substances. A substance is toxic if it meets or may meet one of the following criteria:
  - an immediate or long-term effect on the environment
  - a danger to the environment on which human life depends
  - a danger in Canada to human life or health.
- control of cleaning agents and water conditioners that contain nutrients that promote growth of aquatic vegetation
- environmental quality guidelines and environmental protection regulations for federal works, undertakings and lands.

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[3] The pieces of legislation that were combined were the federal *Clean Air Act*, most of the *Environmental Contaminants Act*, and the *Ocean Dumping Act*.

## Administration

The Act is a joint responsibility of the federal Minister of the Environment and the federal Minister of Health. The issues and related jurisdiction that are relevant to water management in Alberta are shown in Table E.2.[4]

**Table E.2 Issues and Related Jurisdictions**
***Canadian Environmental Protection Act***

| Issue | Jurisdiction |
|---|---|
| Advisory committees | • For the purposes of carrying out the act<br>• In areas of national action, cooperative action, or avoiding conflict and duplication – in cooperation with provincial governments |
| Environmental quality objectives, guidelines, and codes of practice | • Nation-wide<br>• Covers environmental effects on people's lives and health (responsibility of the Minister of Health) |
| Toxic substances | • Nation-wide<br>• Joint responsibility with the Minister of Health |
| Nutrients | • Nation-wide<br>• Regulates cleaning agents and water conditioners |
| Works, undertakings, and lands | • Federal departments, agencies, crown corporations<br>• Environmental quality guidelines require approval of Governor-in-Council (federal Cabinet)<br>• Environmental protection regulations in absence of other federal regulatory power and with concurrence of responsible Minister |

The Canadian Council of Ministers of the Environment (CCME) is one of the advisory committees established under the Act. The CCME is responsible for the *Canadian Water Quality Guidelines* and guidelines for the management and clean up of contaminated sites.

Under the Act, the Government of Canada has signed an agreement with the Government of Alberta entitled *An Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances in Alberta*. This agreement states that Alberta has provisions that are equivalent to the provisions under the Act in the areas of standards, measurement or testing methods, penalties, enforcement measures and policy, and the public's ability to request investigations. The agreement also provides that amendments to Alberta's *Environmental Protection and Enhancement Act* will not contain standards or measurement and testing methods that are less stringent than those in the Act.

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[4] The Act also deals with international air pollution and ocean dumping.

The *Equivalency Agreement* enabled the federal government to issue an order that the following regulations under the Act do not apply in Alberta:

- *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*
- *Secondary Lead Smelter Release Regulations*
- *Vinyl Chloride Release Regulations*
- parts of the *Pulp and Paper Mill Defoamer and Wood Chip Regulations*.

### Influence on Water Management

The environmental quality objectives, guidelines, and codes of practice developed under the Act have no legal authority, but are used extensively by many provincial jurisdictions in developing provincial objectives and standards. One of the most important federal guidelines for water management is the *Canadian Water Quality Guidelines.* These guidelines are use-specific and cover an extensive list of water quality parameters.

The Act prohibits the manufacture or sale of a cleaning agent or water conditioner if it contains a concentration of a nutrient higher than allowed under the regulations. The nutrients that are regulated include those that promote the growth of aquatic vegetation (e.g., phosphorous).

The Act has a number of features related to toxic substances (as defined under the Act), including:

- ***Priority Substances List*:** This list identifies substances that need to be assessed as to whether or not they are toxic or capable of becoming toxic. Any person may, in writing, request that a substance be added to this list.
- ***Assessment of priority substances*** to determine if they are toxic substances. When assessment of a priority substance is prepared, people may be required to submit information, data, and samples on the substance and its toxicity and information on procedures for manufacturing or using the substance. The report of the assessment must be made public. If a substance is determined to be toxic, regulations can be developed under the Act to manage the substance.
- ***List of Toxic Substances*:** This list identifies substances that have been assessed as being toxic. Substances are added to the *List of Toxic Substances* by the Governor-in-Council (federal Cabinet). Regulations are made governing such things as import, manufacture, transportation, storage, and monitoring of toxic substances and the release of toxic substances into the environment.
- ***Reporting and remedying damage*** from unauthorized releases of toxic substances.

- ***List of Prohibited Substances***: This list identifies toxic substances that cannot be used in or exported from Canada (e.g., mirex, alachlor).
- ***List of Substances Requiring Export Notification***: People planning to export substances on this list (e.g., DDT, tetraethyl lead) are required to give notice of their intent. The requirement for notice is limited to:
  - the first initial shipment
  - the first shipment following a new regulation or amendment imposing restrictions on an activity relating to the substance
  - the government of the destination country takes action to prevent import of the substance
- ***List of Hazardous Wastes Requiring Export or Import Notification***: People planning to import or export hazardous wastes on this list are required to give notice of their intent.

### *Who Could Be Affected*

The Act has limited direct effect on water users in Alberta because of the existence of the *Equivalency Agreement*. If additional regulations are implemented under the Act, however, these regulations would apply in Alberta in the absence of an amended *Equivalency Agreement*. Indirectly, the Act will affect Alberta water users through the control of nutrients, the application of the various provisions related to toxic substances, and the use of the CCME's *Canadian Water Quality Guidelines*.

### *Authority to Issue Approvals*

The Act prohibits and permits activities through the lists of priority, toxic, prohibited and hazardous substances and regulations on such things as the manufacturing and release of toxic substances and the maximum concentration of nutrients in cleaning agents.

### *Enforcement Procedures*

The Minister may appoint inspectors and analysts for the purpose of enforcing the Act.

An investigation of an offence under the Act may be initiated by any two residents of Canada who feel an offence has been committed. If an investigation is requested, the Minister must report on the findings within ninety days of the request.

Offences under the Act include:

- failing to comply with the Act or regulations
- failing to assist an inspector

- providing false information or failing to provide the Minister with information.

Fines for offences range up to $100,000 and/or imprisonment for up to five years.

New legislation (Bill C-32) was passed by the House of Commons to modernize the *Canadian Environment Protection Act* and came into effect in March 2000.

For further information, contact:

The Office of the Minister of the Environment
Tel: (819) 997-1441 Website: http://www.ec.gc.ca/CEPARegistry/

## E.2.4 *Fisheries Act*

RSC 1985, c. F-14

**NOTE**

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### *Background and History*

The *Fisheries Act* dates back to 1867, the year of Confederation. It was passed under the federal government's jurisdiction over seacoast and inland fisheries and was meant to regulate and protect fisheries.

Over the decades, the *Fisheries Act* became the major means for the control of water pollution by the federal government. Regulations for dealing with liquid effluent from several industries were added in the early 1970s. In 1977, the *Fisheries Act* was amended to include fish habitat protection provisions (Sections 20-22, 26-28, 30, 32, and 34-37).

The *Fisheries Act* applies to all marine and freshwater fisheries across Canada, including the Bow River Basin.

## Basic Principles

The *Fisheries Act* is a long and complex piece of legislation. However, the following provisions are particularly relevant to the protection and conservation of fish and fish habitat. They deal with the obstruction and the pollution of waters in which fish are present and the harmful alteration, disruption or destruction of fish habitat.

### *Obstruction to Fish Passage*

Under s. 20 of the Act, where there is an obstruction such as a dam in a watercourse, the Minister may require the owner to provide an effective fish-way. (If the construction of a fish-way is not feasible and fish habitat upstream is not accessible to fish, the Minister may instead require the owner or occupier to provide compensation in accordance with the *Fish Habitat Management Policy.*) The Minister must approve the fish-way before construction begins and the owner is required to ensure at his/her own costs that the fish-way can work efficiently. The Minister may also require that the owner of an obstruction make provision for the passage of fish during the period of construction and insist at any time that a sufficient flow of water is maintained in the fish-way. Once the dam or other obstruction has been built, the owner can also be required to release water for the safety of fish and for the flooding of spawning grounds.

In addition to the penalties under the Act, which will be considered later, the Minister may arrange for the construction of a fish-way and charge the owner with its cost or the removal an obstruction if, after notice, the owner fails to do so.

### *Fish Habitat Protection*

A very powerful regulatory tool is provided by s. 35 of the Act, which prohibits anyone from carrying on any work or undertaking (not authorized by the Minister) that results in the harmful alteration, disruption or destruction of fish habitat. The protection of fish is also achieved indirectly by provisions that enable the Minister to require, where it is deemed necessary, the installation of fish guards on all intakes, ditches, channels or canals (s. 30).

Section 22(3) also gives the Minister the authority to order water released from a reservoir or other structure constituting an obstruction. The water must provide for the safety of fish or the safety of fish eggs deposited on spawning grounds.

### *Pollution of Water Frequented by Fish*

The federal government's strongest general regulation of water pollution is found in s. 36 of the Act. Unless allowed by regulations under the *Fisheries Act*, the deposit of a deleterious substance of any type is prohibited in water frequented by fish or in any place where the deposit of the deleterious substance may enter water frequented by fish.

As explained in the section dealing with jurisdictional responsibilities, the federal government does not have an unrestricted power to deal with all aspects of water pollution. Instead, the federal government deals with those issues over which it has jurisdiction – in this case, the deposit of a deleterious substance into waters frequented by fish. As a result, the pollution prohibited under the *Fisheries Act* covers substances that are harmful to fish, fish habitat or to the human use of fish. A person who contemplates work that is likely to result in either the disruption of fish habitat or the deposit of a deleterious substance may be required to provide the Minister with information relating to the project to enable the Minister to assess its effects. The Minister may then require modification to the project or restrict its operation.

## Administration

As a federal statute, the *Fisheries Act* is administered by the Minister of Fisheries and Oceans on behalf of the federal government. The Habitat Management staff of the Department of Fisheries and Oceans, Prairies Area, is responsible for delivering the habitat management program in Alberta. The pollution provisions (parts of Sections 36-42) are administered by Environment Canada on behalf of the Minister of Fisheries and Oceans.

The Minister of the Department of Fisheries and Oceans is authorized under s. 5(1) of the Act to designate fisheries officers, who are responsible for enforcement of the Act. Alberta provincial conservation officers have been designated as fisheries officers by the Minister of Fisheries and Oceans. In addition, the Department of Fisheries and Oceans has fisheries officers working out of four district offices in Alberta. One of their duties is to enforce the *Fisheries Act*.

The federal and Alberta governments have signed the *Canada-Alberta Administrative Agreement for the Control of Deposits of Deleterious Substances Under the Fisheries Act*, which establishes:

- a management committee to implement the agreement
- roles and responsibilities – Alberta Environment is the lead response agency (except where a release occurs within federal lands, works or undertakings) and will take the lead in joint investigations

- agreement on administration of the *Pulp and Paper Effluent Regulations* under the *Fisheries Act*.

### Influence on Water Management

The importance of the *Fisheries Act* in Alberta has been demonstrated in recent years by the environmental assessment of the Alberta Pacific pulp mill project, the Oldman River Dam, the Pine Coulee Project, and the Little Bow Project. Because most of the waters in the Bow River Basin contain valuable species of fish, the federal powers are of great significance to water management in the region. The federal government can influence the design of any project that obstructs fish-bearing waters and can treat the disruption of fish habitat or the deposit of deleterious substances as offences punishable under the Act. It has the power to regulate (in the interests of fish passage and downstream flows) water control structures, water intakes, any deleterious effluent, and activities that result in habitat alteration.

### Who Could Be Affected

The *Fisheries Act* affects more water users in the Basin than any legislation other than the provincial *Water Act* (see section E.3.8). Every person who carries on activities in or near a watercourse runs the risk of damaging fish habitat. Owners of dams and water control structures could be required to provide a fish-way or fish screens or to release water for fish protection. Municipalities and industries could be in violation of the Act if their effluent is harmful to fish.

### Authority to Issue Approvals

The *Fisheries Act* was designed to protect the resource through a series of prohibitions. However, the Minister can authorize the destruction of fish habitat pursuant to Section 35(2) of the Act. An authorization would include conditions that the person building the project would need to meet to minimize impacts to fish and their habitat and generally include conditions to compensate for damage to fish habitat. The Department of Fisheries and Oceans considers work undertaken in compliance with the conditions of an authorization to be in compliance with the *Fisheries Act*. Building a project in accordance with provincial specifications does not provide immunity from prosecution under a federal law.

Similarly, the deposit of a deleterious substance (s. 36) does not constitute an offence if it is carried out in accordance with regulations under the Act. Regulations that include the ability to authorize the discharge of liquid effluent have been established for the following industries:

- Chlor-alkali mercury
- Metal mining
- Potato processing plants
- Meat and poultry products plants
- Petroleum refineries
- Pulp and paper

### Enforcement Procedures

The legislation provides strong penalties for contravening the Act. Offences can be categorized according to their severity, so that anyone who harmfully alters, disrupts or destroys fish habitat or deposits a deleterious substance in fish-bearing waters may be subject to fines of up to $300,000 upon summary conviction (for less serious offences), up to $1 million upon indictment (for more serious offences), and imprisonment for subsequent offences of either type.

As discussed earlier in this section, Environment Canada is responsible for administering the pollution provisions of the Act and Alberta provincial fish and wildlife officers have been designated federal fisheries officers under the Act.

For more information, contact:

Department of Fisheries and Oceans
7646 – 8 Street NE
Calgary, Alberta
T2E 8X4
Tel: (403) 292-5160

## E.2.5 *Navigable Waters Protection Act*

RSC 1985, c. N - 22

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### Background and History

The *Navigable Waters Protection Act* is an old piece of legislation, dating back to 1882. Its primary purpose is to protect the public right of navigation on all waterways deemed navigable by the Minister of Fisheries and Oceans.

### Basic Principles

The Act allows the federal minister to control obstruction to navigation by prohibiting the construction of works in, on, over, through or across any navigable water without the approval of the Minister of Fisheries and Oceans unless, in the Minister's opinion, the work does not substantially interfere with navigation. Any works constructed or placed in any navigable waterways are subject to an application for approval under the Act. The Minister may order the owner of works that have been built without approval to remove or alter them and, if the owner fails to do so, may arrange for the removal or alteration of the works. There are also prohibitions against the deposit of rubbish or other material that might interfere with navigation (s. 21-22).

### Administration

The Act is administered under the Canadian Coast Guard (Department of Fisheries and Oceans) and applies directly to all projects in bodies of water within the province, including those under the control of the provincial government.

### Influence on Water Management

The legislation has a potentially important impact on any water management activity that involves the obstruction of navigation in the Bow River. It can apply to any permanent work in the river, unless the federal minister is satisfied that there is no significant interference with navigation. Although the legislation for many years was not vigorously enforced and major obstructions to navigable waters were built without federal approval, recent litigation has emphasized its continuing relevance. The Act requires the federal government to decide whether to issue an approval for any project that interferes with navigation. Under the *Canadian Environmental Assessment Act* (see section E.2.2), the federal government can demand an environmental assessment of projects subject to approval under the *Navigable Waters Protection Act*.

### Who Could Be Affected

Although the *Navigable Waters Protection Act* has a less pervasive influence than the *Fisheries Act*, it nevertheless affects all water projects involving works that are installed in navigable waters – including projects under the control of the provincial government. The legislation covers existing works for which approvals were not obtained, as well as future projects, whether they are planned by the provincial government, municipalities, irrigation districts, private companies or individuals.

### *Authority to Issue Approvals*

The Act contains no criteria upon which an application for an approval may be granted. Consultation with Canadian Coast Guard officials concerning procedures in making application under the Act is recommended.

### *Enforcement Procedures*

The Act does not provide for inspections, but relies solely on ministerial discretion in deciding the extent to which its provisions are enforced. Determination of navigability and assessment of impacts on the public right of navigation are based on site inspections and review of the application. It establishes a maximum fine of $5,000 for a failure to comply with a ministerial order to remove or alter an obstruction that has been constructed without approval. This sanction is bolstered by the ability of the Minister to remove or alter offending structures. A fine of $5,000 can also be levied for the deposit into water of rubbish that is liable to interfere with navigation.

For further information, contact:

Canadian Coast Guard
4253 – 97 Street
Edmonton, AB
T6E 5Y7
Tel: (780) 495-6325

## E.3 Provincial Government

### E.3.1 *Agricultural Operation Practices Act*

RSA 2000, c. A-7

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation and regulations should be consulted for all purposes of interpreting and applying the law.

The *Agricultural Operation Practices Act* provides the institutional framework for resolving conflicts between agricultural producers and urban/rural non-farmers. Under the Act, farmers using generally accepted practices and not contravening the land use bylaws of the municipality in which the operation is located are not liable in a nuisance lawsuit and cannot be prevented from carrying on their operation because it causes or creates a nuisance.

## E.3.2 *Environmental Protection and Enhancement Act*

RSA 2000, c. E-12

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### *Background and History*

Since its creation in 1971, Alberta Environment (AENV) has been responsible for a broad body of environment legislation. The *Environmental Protection and Enhancement Act* (EPEA) came into force on September 1, 1993 and established a new environmental protection regulatory framework. EPEA accommodates the public's desire to be more directly involved in decisions affecting the environment, provides for stronger enforcement, and better reflects the province's commitment to sustainable development.

### *Basic Principles*

*Regulation of Activities*

Approvals or registrations are required from AENV to ensure proposed activities that could cause an adverse effect[5] on the environment are reviewed or are operated in accordance with regulatory standards.

EPEA sets out a broad schedule of activities[6] that could adversely impact the environment, ranging from processing natural gas to drilling water wells. Regulations (*Activities Designation Regulations,* AR 211/96) list those activities that require an approval or registration. The regulations should be consulted for details since the list is, in places, quite specific and some activities that can be governed by EPEA may not require an approval.

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[5] The Act defines an adverse effect as impairment of or damage to the environment, human health or safety or property.

[6] The Act does not define activities, but instead, in the Schedule to the Act, provides a list of activities. The schedule always prefaces a physical thing by words such as release, construction, operation, reclamation, drilling, etc. Often specific activities are referred to as projects.

For activities with a high potential to cause an adverse effect on the environment, an approval is required. If an approval is issued, terms and conditions are specified in the approval to protect the environment. For activities with a low potential to cause an adverse effect on the environment, a registration is required. The registration requires the applicant to operate his/her works to meet environmental standards contained in a code of practice established under EPEA.

### *Regulation of Releases*

The control of releases[7] of substances into the environment is principally dealt with in the terms and conditions of a project's approval and through regulations accompanying EPEA. These regulations usually set limits for authorized releases. Where there is a conflict between regulations and approvals, the more stringent measures will apply.

EPEA has two prohibitions related to the release of a substance into the environment. First, it prohibits a release that is in excess of that expressly prescribed by:

- an approval issued under EPEA
- the regulations issued under EPEA.

Second, it prohibits a release that causes, or may cause, an adverse effect unless the release has been authorized by an approval or regulation issued under EPEA or by another enactment of the provincial or federal governments.

EPEA requires the reporting and cleaning up of substances that cause or may cause an adverse effect on the environment. The person responsible for the unauthorized release of a substance must immediately notify Alberta Environment (toll free: 1-800-222-6514 or cellular #7378) and those who may be directly affected by the release. The person must also take all reasonable measures to correct the problem. An unauthorized release must be reported and corrected, even if it was an accident.

### *Land Conservation and Reclamation*

The Act provides statutory requirements to ensure that, for designated industrial activities, the land is reclaimed to a capacity that is equivalent to the capability that existed prior to the activity. The *Conservation and*

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[7] The term "release" includes, but is not limited to spills, spraying, leaks, dumping, discharges, exhaust, and throwing something away.

*Reclamation Regulation* (AR115/93) specifies the industrial activities for which reclamation is required.

Security deposits are required for some designated activities to ensure satisfactory completion of conservation and reclamation. When the duty to conserve and reclaim specified land has been met, a reclamation certificate is issued.

### *Designation of Contaminated Sites*

EPEA includes provisions for cleaning up contaminated sites. AENV can designate areas as contaminated sites where a substance is causing a significant adverse effect on the environment. AENV can also establish who is responsible for cleaning up these sites. The designation of a contaminated site must be made public and those directly affected can submit a statement of concern outlining suggested remedial actions.

The Minister may establish programs to pay the costs of cleaning up contaminated sites and the affected environment where a person responsible for a site cannot be identified or is unable to pay. The Minister may also compensate any person who suffers loss or damage as a direct result of the designation and cleanup of a contaminated site.

A person responsible for the site can voluntarily prepare a remedial action plan for the site (to be approved by the director[8]) and enter into an agreement with the director and/or others for remedial action. When such an agreement is adhered to, an environmental protection order for site cleanup cannot be issued against the parties to the agreement.

### *Ground Water and Related Drilling*

EPEA regulates the drilling of water wells and provides protection for ground water.

### *Potable Water*

EPEA regulates the treatment and supply of water for human consumption. The operator of a waterworks system is required to ensure that:

- the water in the system does not contain substances that exceed the maximum concentrations set out in the approval or the regulations
- the water supplied by the system is fit for any of its intended uses.

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[8] EPEA often makes reference to the "Director." The Minister is allowed to appoint directors and their appointments specifically refer to those provisions of EPEA over which they are empowered to act. In some cases, more than one employee may be appointed to have responsibility for a provision in EPEA. A specific director is identified here when only one employee is currently appointed to be responsible for a provision.

### *Hazardous Substances*

EPEA requires anyone who keeps, stores or transports a hazardous substance or pesticide to ensure that the hazardous substance or pesticide does not directly or indirectly come into contact with or contaminate any animals, plants, food or drink. The sale or distribution of anything that contains or has been contaminated by a hazardous substance or pesticide in excess of federal regulation is prohibited. The transport and disposal of hazardous waste is prohibited except in accordance with EPEA.

The approval for using pesticides is generally controlled by federal legislation (e.g., the *Pest Control Products Act* and the *Fertilizer Act).* All aspects of pesticide use, handling, and clean-up are prohibited unless done in accordance with the regulations or the label on the pesticide container. The Director can require an applicant for approval or registration to justify the use or application of a pesticide if there are alternative pest control methods that could be used.

### *Environmental Assessment*

EPEA establishes a legislated process for reviewing the potential environmental impact of proposed activities. For some proposed activities, an environmental impact assessment (EIA) report is mandatory. Some activities are exempt from the environmental assessment process, although in all cases activities are reviewed to ensure that potential environmental impacts can be addressed through approvals issued under EPEA. The mandatory and exempt activities are listed in the *Environmental Assessment (Mandatory and Exempted Activities) Regulation* (AR 111/93). Among the activities that are exempt from EIAs are municipal water and wastewater treatment facilities and the maintenance and rehabilitation of water management projects.

### *Wastewater and Storm Drainage*

EPEA regulates the operation of wastewater collection and treatment systems as well as the disposal of wastewater sludge and storm drainage. The regulations refer to the most recent edition of the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage. Waste Control Regulation* (AR 192/96).

EPEA regulates waste storage sites and a variety of wastes ranging from hazardous waste, hazardous recyclables, solid waste (landfills), and litter.

EPEA prohibits the disposal of waste except in accordance with an approval, registration (code of practice), or regulations under EPEA. Approvals and codes of practice specify requirements for siting, design, construction, operation and reclamation of certain types and classes of waste handling facilities.

Hazardous wastes within Alberta are tracked from "cradle to grave" through a manifest system specified in EPEA and its regulations.

### Administration

EPEA sets out the general powers and responsibilities of the Minister of Environment in areas such as advisory committees, delegation of authority, transfer of administration of EPEA, and coordination with other provincial government departments and other governments including municipalities.

EPEA also allows the Minister to develop economic and financial instruments and market-based approaches to protect the environment, achieve environmental quality goals in a cost-effective manner, and provide financing for programs and other measures for environmental purposes. This can include tradable emission permits, recycling incentives, subsidies, differential levies, and emission, effluent and waste disposal fees.

Under EPEA, Alberta has signed two key agreements with the federal government:

- *An Agreement on the Equivalency of Federal and Alberta Regulations for the Control of Toxic Substances in Alberta,* which states that Alberta has provisions that are equivalent to the provisions under the *Canadian Environmental Protection Act* (see section E.2.3) in the areas of standards, measurement or testing methods, penalties, enforcement measures and policy, and the public's ability to request investigations. The agreement also provides that amendments to the *Environmental Protection and Enhancement Act* will not contain standards, measurement and testing methods that are less stringent that CEPA. This agreement has allowed the federal government to issue an order that the following regulations under CEPA do not apply in Alberta:
    - *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*
    - *Secondary Lead Smelter Release Regulations*
    - *Vinyl Chloride Release Regulations*
    - parts of the *Pulp and Paper Mill Defoamer and Wood Chip Regulations*.

- *Canada-Alberta Administrative Agreement for the Control of Deposits of Deleterious Substances Under the Fisheries Act* which establishes:
    - a management committee to implement the agreement
    - roles and responsibilities – Alberta Environment is the lead response agency (except where a release occurs within federal lands, works or undertakings) and will take the lead in joint investigations
    - agreement on administration of the *Pulp and Paper Effluent Regulations* under the *Fisheries Act.*

The Minister is also required to develop ambient environmental quality objectives and report annually on the state of the Alberta environment.

- *Canada-Alberta Agreement for Environmental Assessment Cooperation*, which allows the federal and provincial governments to cooperate and coordinate so that their processes for environmental assessment are effective and consistent and avoid uncertainty and duplication.

EPEA creates two administrative bodies:

- **Sustainable Development Coordinating Council** - The Coordinating Council coordinates, reviews and makes recommendations to the Minister on interdepartmental matters related to sustainable development and protection of the environment. The members of the Council are deputy ministers of provincial departments and other senior provincial officials including the chairman of the Natural Resources Conservation Board (NRCB).

- **Environmental Appeal Board** - The Environmental Appeal Board (EAB) hears appeals of various decisions made under the Act. The EAB has the authority to decide appeals of administrative penalties and refusals of requests for confidentiality. On other appeals, the EAB makes recommendations to the Minister who then decides how the appeal should be dealt with. The members of the EAB are appointed by the Lieutenant Governor-in-Council (provincial Cabinet).

  EPEA specifies the circumstances under which an appeal can be heard. These include situations where approvals are issued or refused, certain environmental protection orders and enforcement orders are issued, and administrative penalties are charged. EPEA also specifies who can make an appeal.

In most cases, a decision is not stayed or put on hold during an appeal unless the Minister agrees to such a request. For example, an environmental protection order must continue to be complied with unless a request to the contrary is approved by the Minister.

The Minister's decisions and EAB reports must be made public.

EPEA establishes an Environmental Protection and Enhancement Fund for environmental emergencies.

Money for this fund may come from a variety of sources such as:

- provincial government general revenue (as an advance by the Provincial Treasurer)
- forfeited security deposits (requires ministerial approval)
- royalties, rents, and penalties (requires Treasury Board approval).

The fund is currently used for emergency cleanup of spills, land reclamation, forestry research and improvement, control of forest fires, and flood damage assistance.

### *Influence on Water Management*

EPEA provides an extensive framework for: evaluating the impacts of a proposed development on water quality, protecting both surface and ground water, regulating deposition of harmful substances into water bodies, and managing land and water-based activities that can have a significant impact on the quality of water supplies.

### *Who Could Be Affected*

EPEA will affect those who want to engage in the many activities that require assessment or approval under EPEA. EPEA will also affect those who are directly affected by activities that have or could have an adverse effect on the environment.

Individuals are required to report environmental accidents and to bear the cost of those they cause. Individuals must also clean up unsightly property and assist investigators when necessary.

One of EPEA's cornerstones is the guarantee of public consultation in decisions affecting the environment. This includes increased access to information, participation in the environmental assessment and approval processes, and the right, when directly affected, to appeal certain decisions.

Under EPEA, public consultation is required on development of:

- ambient environmental quality objectives
- regulations for maximum visible emissions and the concentration, amount, level, or rate of a substance permitted to be released into the environment.

Public notice is required for input into certain decisions before they occur. These decisions include proposed terms of reference for an EIA report, applications for approvals, and proposals to change a term or condition in an approval.

Public notice is also required when certain decisions have occurred. These decisions include final terms of reference for an EIA report, issuance of an approval, and issuance of a certificate of variance.

Public notice of an application or an AENV-proposed change in a term or condition can be waived if there is an emergency, it is a routine matter, or adequate notice has already been given.

People can file a response to public notices issued under EPEA. The right to file a response to a notice is governed by time limits and some restrictions on who may file a response.

### Authority to Issue Approvals

*Environmental Assessment*

The environmental assessment process begins with the proponent, government departments, local authorities, or others informing AENV of a new project. For mandatory projects, an EIA report is automatically required.

The Federal Minister of the Environment is able to negotiate harmonized environmental assessment procedures that provide for joint panel reviews with other jurisdictions, such as provincial governments. This is to prevent possible overlaps or confusion with the environmental assessment processes of provincial governments.

For non-mandatory activities, all potential environmental impacts are reviewed to see whether they can be addressed through approvals issued under EPEA. If the approving director feels that further consideration of the project is needed under the environmental assessment process, he or she may refer the proposed project to the director responsible for environmental assessments for further consideration. This director then considers various factors, including the location, size, and nature of the activity to decide if further consideration is required. If it is, the director will prepare a screening report. Public notice of this screening is given. The screening report is available to the public. The director then decides if an EIA report is required. The Minister may order an environmental assessment report where the director has decided otherwise.

Proposed terms of reference for the EIA report are prepared by the proponent. Following public review, the Director of Environmental Assessment and Strategy will issue final terms of reference.

The proponent is responsible for preparing an EIA report in accordance with the terms of reference and the requirements of EPEA. Some EIAs are reviewed by either the Alberta Energy and Utilities Board (EUB) or the NRCB. EPEA requires that the documents and other information regarding EIAs be publicly available through a central registry.

### *Approvals*

The approval process begins with an application from the proponent of an activity. The application must contain the information required by the regulations and any additional information required by the director from AENV who is responsible for issuing the approval. The intent is to have a one-window approval process, so only one application for an approval is required even though a proposed activity may affect different parts of the environment, e.g., air, water, and land.

In deciding to issue or refuse to issue an approval, the director must consider criteria in the regulations and applicable decisions of the NRCB or EUB. The director may also consider evidence related to those decisions.

If an approval is refused, the proponent has the right to appeal the decision to the EAB. The proponent may also appeal the terms and conditions included in an approval.

An approval may contain an expiry date. The expiry date can be extended but, after the first extension, this can only be done when necessary to allow effective public review of the renewal of the approval. An approval may also contain any terms and conditions the director considers appropriate, as long as the terms and conditions are not less stringent than the terms and conditions provided in the regulations.

A term or condition in an approval can be amended:

- on application from the approval holder
- if an adverse effect – not reasonably foreseen when the approval was issued – is occurring or may occur

- if the approval is transferred, sold, leased, assigned or otherwise disposed of
- to change a monitoring or reporting requirement
- to address a temporary suspension of the approved activity.

An approval holder or a person engaged in activity governed by the regulations may apply to vary a term or condition in an approval or a requirement of the regulations. The application for variance must show the nature and extent of consultations the applicant has had with those people who would be directly affected by the proposed variance. The Minister may grant a certificate of variance if:

- factors beyond the control of the applicant cause operations that are contravening or are likely to contravene the approval or the regulations
- the proposed variance is not likely to cause a significant adverse effect
- refusal to grant a certificate would result in serious economic hardship to the applicant without offsetting benefit to others.

Certain activities designated in the regulations cannot begin unless a certificate of qualification has been issued by the appropriate director of AENV or an authorized representative of an organization designated by the director. For example, a certificate of qualification is required for an operator of a municipal wastewater treatment plant.

### *Registrations*

For activities with a low potential to cause an adverse effect on the environment, a registration is required. The registration requires the applicant to operate his/her works in accordance with codes of practice established under EPEA. The *Activities Designation Regulation* (AR 211/96) lists those activities that require a registration.

An application for registration must contain the information required by regulation. The applicant must also certify that they have read and understood the provisions contained in the applicable code of practice. A registration is issued when all the applicable information has been received.

A code of practice sets the regulatory standards for the siting, design, operation and reclamation of activities/facilities. Like an approval, a code of practice is enforceable using the procedures and tools within EPEA.

## Enforcement Procedures

Enforcement under the Act is designed to ensure that the environment is protected and wisely used.

An investigation or inspection is the first step in dealing with apparent contraventions of EPEA. EPEA sets out the powers and duties of inspectors and investigators. The information collected from inspections and investigations enables AENV to determine the existence and severity of a contravention and then initiate an appropriate enforcement action.

EPEA provides a wide range of measures to ensure the timely and effective enforcement of environmental regulations. Any two or more residents of Alberta who believe an offence has been committed under EPEA may apply to have an investigation conducted. AENV is required to investigate all matters necessary to determine the facts and report to the applicants on the progress of the investigation and any action taken.

Two key methods in EPEA for dealing with environmental problems are the environmental protection order and the enforcement order. The environmental protection order is intended to prevent environmental problems or, failing that, to ensure that action is taken to fix the problems. Environmental protection orders can require measures such as environmental audits or plans for remedial measures. The enforcement order is used when EPEA has been violated and can result in the shutdown of an activity or the suspension or cancellation of an approval.

When it appears EPEA is being or is about to be contravened, the Director may apply for a court injunction directing the person responsible to take or refrain from taking a particular action. Similarly, individuals have the right to apply for injunctions when they have suffered or are about to suffer damage from a contravention.

Penalties under EPEA vary, but can be as high as $100,000 and/or two years imprisonment for an individual and $1,000,000 for a corporation for knowingly conducting an activity requiring an approval, releasing a prohibited substance, providing false or misleading information, or violating an approval, environmental protection order, or enforcement order. For littering and other less serious offences, the maximum fine is $250 for an individual and $1,000 for a corporation. All other offences have a maximum penalty of $50,000 for an individual and $500,000 for a corporation.

A larger fine can be assessed if the offender benefited monetarily from the offence. As well, the court can order the offender to pay compensation for losses, damage, and remedial or preventative measures.

EPEA exposes corporate officers, directors and public officials to liability for environmental offences.

EPEA enables the government to recover from polluters the cost of cleanups if the government has to take action. EPEA also establishes the right of any person suffering loss or damage due to a contravention of EPEA to sue for and recover an amount equal to that loss or damage.

For further information, contact:

| | |
|---|---|
| Air quality | Tel: (403) 297-7605 |
| Contaminated site management | Tel: (403) 297-7605 |
| Environmental emergencies or complaints | Tel: 1-800-222-6514<br>Cellular #7378 |
| Enforcement and investigation | Tel: (403) 297-8271 |
| Ground water protection | Tel: (403) 297-7605 |
| Land conservation and reclamation | Tel: (403) 297-7605 |
| Pesticides | Tel: (403) 297-8271 |
| Recycling depots | Tel: (403) 277-7770<br>or 1-800-463-6326 |
| Waste management recycling | Tel: (403) 297-7605 |
| Water quality | Tel: (403) 297-7605 |
| For general enquires or assistance on other matters: | Tel: (403) 297-3362 |

Copies of the *Environmental Protection and Enhancement Act* may be obtained from:

Publication Services
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB T2P 4E8 Tel: (403) 297-6251

## E.3.3 *Forests Act*

RSA 2000, c. F-22

**NOTE**

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### Background and History

The *Forests Act* dates back to 1949. The Act gives the Minister jurisdiction, control and administration over all matters in any way connected with timber on Crown land. The *Forests Act*, 1961, was a major amendment to provincial forestry legislation that repealed and replaced the former Act. The Act provides three basic forms of tenure: forest management agreements (FMAs), timber quota certificates, and a variety of permits. The quota and forest management units were introduced under this Act from 1965 to 1966. Additional amendments have been made to the Act in subsequent years.

### Basic Principles

The rights to harvest the timber resource in Alberta are granted through a legal document called a timber disposition. There are two general types of dispositions: an FMA under which specific timber management rights on a land area are included, and a timber licence or timber permit where rights are given to a volume of timber, but no rights specific to land are involved. A licence contains several general operating conditions dealing with watercourse and environmental protection and may also contain "special" and "other" watercourse protection conditions. Detailed operating conditions are contained in an approved annual operating plan.

The *Alberta Timber Harvest Planning and Operating Ground Rules* (1994) provide direction to timber operators and employees of Alberta Sustainable Resource Development for carrying out timber operations on timber licence and permit areas in Alberta. Detailed ground rules specific to each FMA are negotiated and embodied within the agreement. The ground rules cover pre-disturbance watershed assessment, stream crossings, road planning and construction, timber harvest planning, reforestation, and operations and forest landscape design. Standards within the ground rules specify the minimum requirements needed to achieve objectives.

*Alberta Timber Harvest Planning and Operating Ground Rules* are authorized under Section 5 of the *Forests Act* and Section 100 (b) of the *Timber Management Regulation.* Compliance with the provisions and requirements of the ground rules is a standard condition of all coniferous and deciduous timber licences and permits.

### Administration

The legal scheme for management of Alberta's forests is set out in the *Forests Act.* Alberta's forests are owned by the Province and are referred to in the *Forests Act* as "Crown timber." The Act describes the ways the Minister of Sustainable Resource Development can dispose of that timber and the restrictions placed on him or her when making such dispositions of Crown timber. The Minister authorizes the Land and Forest Division in the Green Area of Alberta to carry out day-to-day responsibilities for administering the *Forests Act.*

Forest management unit plans are required for every Forest Management Unit established by the Minister under Section 14(1) and (2) of the Forests Act. This planning authority extends to provincial crown land and does not pertain to federal or private land. FMA holders assume this responsibility from the government and prepare Detailed Forest Management Plans. The transfer of responsibility occurs through the negotiation of an agreement that is approved by Order in Council. Section 10 of all FMAs outlines the specific planning requirements.

Monitoring and control of ground rule applications are done through on-site inspections. The inspection work is routinely done by a forest officer, acting on behalf of other resource interests such as wildlife, fisheries, and recreation. The scale of operations in Alberta has reached a point where alternate methods for achieving adequate timber-related and non-timber monitoring and inspections are being considered.

### Influence on Water Management

The manner in which timber is removed from all Crown land within a river basin is subject to the terms or conditions of a timber disposition in accordance with the *Forests Act.* The removal and transportation of timber from forested land may affect the quantity and quality of water that flows from that land. Forest harvesting generally increases annual water yield. A study near Hinton showed an average 27% increase in annual flow where 50% of the basin was logged. Applying sustained yield management over large basins results in only about 1% of the basin being logged each year. The effects of timber on water yield in such basins are minimal because the proportion of the basin harvested each year is so small.

Forest harvesting may contribute to the natural amount of sediment in streams. Soil erosion in upland areas is not a major concern in most areas. Provincial operating ground rules, if followed, will protect the soil. The focus of erosion control should be on point sources of sediment delivery to streams, especially roads, as this is where the greatest erosion problems occur.

The timber licence contains several general conditions dealing with watershed protection including: minimizing the impacts of harvest operations on water yield and watercourse structure, preventing debris from entering a watercourse, diverting of watercourses, the construction and maintenance of crossings over watercourses, measures to minimize and mitigate damage caused by road construction, and the avoidance of water-source areas.[9] Water-source areas are identified using procedures described in the *Predisturbance Watershed Assessment Manual* (ENR Pub. T/100). Other operating conditions may include such things as the designation of slopes on which cutting would not be permitted.

### Who Could Be Affected

The *Forests Act* and the *Timber Management Regulations* affect anyone or any company involved in the removal of timber from Crown land within the Bow River Basin. This may include the forest industry, agricultural users, the minerals industry (e.g., oil and gas, seismic, surface minerals), municipalities, tourism developers, commercial recreation operators and recreational users.

### Authority to Issue Approvals

Land and Forest Division administers timber on all public land and issues timber licences and timber permits under authority of the *Forests Act*. Licences are approved by the Director, while permits and annual operating plans are approved by the Forest Area Manager.

### Enforcement Procedures

Offences and penalties are set out in the *Forests Act. The Timber Management Regulations* contain schedules that specify penalties for each contravention of any provision of the Act and regulations. The Minister may, in writing, direct a person engaged in a timber operation to vary a procedure or alter any method used in the timber operation within the time specified in the order. If the person fails to comply with the direction, the Minister may perform any work necessary to mitigate or rectify the situation. The timber disposition holder must reimburse the Minister for the costs incurred. The Minister may also levy penalties for contravention of the *Forests Act* and regulations. The penalty amount varies depending on the type of contravention.

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[9] **Water-Source Area:** That portion of a watershed where soils are water-saturated and/or surface flow occurs and contributes directly to streamflow.

The Minister delegates authority to enforce certain sections of the *Forests Act* and *Timber Management Regulations* to forest officers. For example, forest officers have the power to stop and search vehicles without a warrant for the purpose of the *Forests Act.* A forest officer may seize and detain any timber if he or she believes that the timber was cut on public land but not under the authority of a timber disposition, or on other grounds as described in the *Timber Management Regulations.*

The *Forest and Prairie Protection Act,* passed into law in 1980, also empowers the Minister to make regulations governing pollution cleanup and the disposal of debris and waste. The regulations, Part II, provide for a person conducting operations in the forest to:

- ensure there is no interference with the normal drainage of water from land
- remove any obstruction caused by operations from any stream channel or watercourse without causing damage to the channel
- prevent soil erosion, sedimentation of streams, or reduction in watershed capacity by the removal of trees, shrubs and other vegetation or any other disturbance and to re-establish vegetation growth on all bare areas
- in lieu of carrying out soil erosion control and re-establishment of vegetation on geophysical lines in designated areas of the province, pay to the Minister the sum of $18.65/km of geophysical line cut or used in the course of that person's operations.

### Sources of Further Information

Alberta Environmental Protection. Land and Forest Division. 1994. *Alberta Timber Harvesting Planning and Operating Ground Rules,* Edmonton.

Department of Energy and Natural Resources. 1985. *Stream Crossing Guidelines: Operational Guidelines for Industry.* G.L. Fisher, A.G.H. Locke and B.C. Northey, Edmonton.

Department of Forestry, Lands and Wildlife. 1986. *Predisturbance Watershed Assessment Manual.* 1986. R. Anderson, D. Asquin and A. Jacobson, Edmonton.

Bankes, N. 1986. *Crown Timber Rights in Alberta.* The Canadian Institute of Resources Law, Calgary, Alberta.

Moen, A.B. 1990. *Demystifying Forestry Law: An Alberta Analysis.* Environmental Law Centre, Edmonton.

## E.3.4 *Irrigation Districts Act*

RSA 2000, c. I-11

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### *Background and History*

The Government of Canada passed the *Northwest Irrigation Act* in 1894, permitting the development of large irrigation projects. Provincial legislation followed with the *Irrigation Act* in 1906, the *Irrigation Districts Act* in 1915, and other legislation that permitted the transfer of projects from corporate interests to the farmers served or to governments as a result of joint federal-provincial agreements to upgrade and expand existing works. In order to consolidate the various rules, regulations and administrative procedures that had evolved, Alberta passed the *Irrigation Act* in 1968. It was followed by the *Irrigation Districts Act,* passed in 1999 and in force as of May 2000.

The purpose of the *Irrigation Districts Act* is to provide for the formation, dissolution and governance of irrigation districts in order that the management and delivery of water in the districts occur in an efficient manner that provides for the needs of water users receiving water through the works of a district.

Private irrigation development not associated with an irrigation district is administered under the *Water Act*.

### *Basic Principles*

The Act defines the purposes and powers of an irrigation district. It provides natural person powers to irrigation districts subject to restrictions on those powers as specified in the Act. The principal elements are adding and removing parcels of land, managing the assessment roll and the expansion limit, transfers, entering into agreements with users, and establishing rates and fees.

Any owner of land assessed with irrigation acres is defined as an irrigator. Any person, including irrigators, receiving water from an irrigation district for any purpose is defined as a user.

*Adding and Removing Parcels* – A parcel of land must be included in the irrigation district in order to be assessed with irrigation acres. There is a procedure outlined in the Act, along with forms in a regulation, to change the area of an irrigation district. Each parcel included in the irrigation district has a notation placed on the certificate of title. When a parcel is removed from the irrigation district, that notation is removed from the title.

*Assessment Roll* – The assessment roll of an irrigation district lists all parcels that contain irrigation acres and acres subject to a terminable or annual agreement. Set out for each of these parcels is the legal description, the name and address of the owner, the number of irrigation acres and the number of acres subject to a terminable or annual agreement. Application may be made to the district to change the assessment roll. Certain criteria in the legislation must be met in order for the irrigation district to approve the application.

*Expansion Limit* – The base expansion limit of each irrigation district is set out in the Act. The sum of the irrigation acres plus the acres subject to a terminable agreement must not exceed the expansion limit. The Act outlines the process for an irrigation district to change its expansion limit. That process entails a public meeting and plebiscite to obtain the approval of the irrigators.

*Transfers* – There are two types of transfers referred to in the Act. An irrigator may apply to the irrigation district to transfer irrigation acres to another parcel subject to certain criteria being met. As well, an irrigation district may apply to transfer an allocation of water, under its water licence pursuant to the *Water Act*. The *Irrigation Districts Act* outlines the criteria that must be met before an irrigation district can make an application for that transfer.

*Entering into Agreements* – There are a number of agreements that may be entered into with an irrigation district. The main agreements are: Annual Agreements for irrigation that expire each year; Terminable Agreements for irrigation that can be cancelled by either party with notice; Household Purposes Agreements; Use of Irrigation Works Agreements that are for purposes other than the delivery or removal of water; Water Conveyance Agreements that are for purposes other than for irrigation or household, and Alternate Parcel Irrigation Agreements that are for purposes of irrigating an alternate parcel not included on the assessment roll.

*Rates and Fees* – Each year the irrigation district must adopt an operating budget and make a rate bylaw specifying the Irrigation rate, the Annual Agreement rate, and the Terminable Agreement rate. A fee bylaw must also be made annually that applies to Household Purposes Agreements, Use of Irrigation Works Agreements and Water Conveyance Agreements.

### Administration

The Act establishes an Irrigation Council appointed by the Minister of Agriculture, Food and Rural Development. Duties of the Council are outlined in the Act and include making recommendations to the Minister on any matter under the Act, monitoring the operation and financial performance of the irrigation districts, and conducting hearings on appeals filed in accordance with the Act.

The Council presently consists of five public members and one representative from each of the provincial departments of Environment and Agriculture, Food and Rural Development.

The Act also establishes an Irrigation Secretariat staffed with employees of Alberta Agriculture, Food and Rural Development. The duties of the Irrigation Secretariat are outlined in the Act and include carrying out functions and duties assigned by the Council, acting as secretary to the Council, and liaising with others in the irrigation industry. The Irrigation Secretariat also administers the Irrigation Rehabilitation Program (see section G.20).

### Influence on Water Management

The purposes and powers of an irrigation district are to: convey and deliver water through its irrigation works in accordance with the Act; divert and use quantities of water in accordance with its water licence under the *Water Act*; construct, operate and maintain its works; and maintain and promote the economic viability of the district.

Uniform land classification standards must be used to determine if land is suitable for irrigation prior to it being added to the assessment roll. Owners and occupiers of land who receive water delivered by the irrigation district are under a duty to take reasonable care in using the water to prevent the water from causing injury to any person or damage to any property. The Act provides an irrigation district with the authority to stop the delivery of water for a number of reasons.

### Who Could Be Affected

The irrigation district manages the water diverted under its water licence. The users of the water for irrigation normally order the water 24 - 48 hours prior to delivery. Conditions of water delivery and conveyance for the various purposes are normally outlined in the agreement with the irrigation district or by bylaws passed by the irrigation district.

Others may be affected by how the water is managed by the irrigation district as a result of operating, maintaining and rehabilitating the irrigation works. Under certain conditions, the Act allows the district to enter on certain parcels to perform these duties.

### Authority to Issue Approvals

An irrigation district acquires the right to receive water diverted from a water body by way of a licence granted under the *Water Act* (see section E.3.8). The *Irrigation Districts Act* authorizes further distribution of the water in accordance with the following:

- through the determination of lands included on the assessment roll
- through water delivery agreements for household and other uses.

For Water Conveyance Agreements, the district must not deliver or remove water under the agreement until the other party to the agreement has complied with the requirements, if any, of the *Water Act*, the *Environmental Protection and Enhancement Act* and the regulations under those Acts.

### Enforcement Procedures

The Act outlines penalties for various offences, including using the water without proper authority, interfering with or causing damage to the irrigation works, contaminating the water, interfering or hindering any person who is exercising a power or carrying out a duty under the Act.

The fine is not more than $5,000 for the first conviction and not more than $10,000 for each subsequent conviction. A person guilty of an offence under the Act is liable on conviction to pay a fine in respect of each day or part of a day on which the offence occurs or continues.

The Act also outlines what the court order relating to the penalty may also direct, for example, repair the works or compensate the irrigation district or other person for loss of or damage to property.

## E.3.5 *Municipal Government Act*

RSA 2000, c. M-26

**NOTE**

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### *Background and History*

A review of the provincial legislation governing municipal government began in 1987 and resulted in the discussion guide *A New Municipal Government Act for Albertans* (introduced in the legislature in 1992). This bill was allowed to die on the order paper.

Following several reviews and amendments, a new bill was introduced and came into effect as the *Municipal Government Act* (MGA) on June 1, 1994. In 1995, the *Municipal Government Amendment Act* was introduced, which provided minor amendments to the MGA and incorporated nearly all of what was previously known as the *Planning Act* (RSA 1980, c. P-9). On September 1, 1995, amendments to the MGA came into effect.

The MGA had been subject to several reviews and amendments prior to the major overhaul in the 1990s. It is interesting to note that control of water bodies under previous legislation was included under "Public Works," more specifically section 172, which primarily dealt with "Title to Highways." A municipality's "control and management" of water was the same as that of roads and bridges, as long as provincial legislation and regulations were adhered to.

Sections 172(3) of the previous legislation states:

> *Subject to every other Act* [e.g., the *Public Lands Act* (see section E.3.7 of the *Guidebook*) and the *Water Act* (see section E.3.8 of the *Guidebook*)], *a council has the control and management of the public highways, roads, streets, lanes, alleys, bridges, rivers, streams, watercourses, lakes, and other bodies of water within the municipality, including the air space above and the ground below.*

The first proposal to separate control and management of water from other public utilities appeared in the discussion guide as "Water Bodies and Air Space" (section 127) under the broad title "Water Bodies, Air Space and Roads." At that time, the concept of a municipality having – subject to provincial regulation – the "direction" as well as the control and management of water bodies was introduced; however, "water body" was not defined.

Section 127(1) stated:

> *Subject to any other enactment* [e.g., the *Water Act* and the *Public Lands Act*], *a municipality has the direction, control and management of rivers, streams, watercourses, lakes and other bodies of water within the municipality, including the air space above and the ground below.*

The current MGA addresses "direction, control and management" of water under Part 3, Division 6, entitled "Miscellaneous Powers." Section 60 deals with a municipality's direction, control and management of water bodies, and section 61 deals with the granting of rights to municipal property. Section 60 now includes a qualifier to "water body" that limits municipal jurisdiction to "natural bodies of water." This change was made to distinguish natural bodies of water from man-made bodies of water such as cooling ponds and reservoirs. "Water body" is still not defined, but receives some further explanation in various regulations such as the subdivision regulations.

It is important to note that section 61 can only be exercised within the context of the authority granted in section 60, subject to other provincial legislation such as the *Public Lands Act* and the *Water Act.*

Sections 60 and 61 read:

60 (1) *Subject to any other enactment* [e.g., the *Water Act* and the *Public Lands Act*], *a municipality has the direction, control and management of the rivers, streams, watercourses, lakes and other natural bodies of water within the municipality, including air space above and the ground below.*

(2) *Nothing in this section gives a municipality the direction, control and management of mines and minerals.*

61 (1) *A municipality may grant rights, exclusive or otherwise, with respect to its property, including property under the direction, control and management of the municipality.*

(2) *A municipality may charge fees, tolls and charges for the use of its property, including property under the direction, control and management of the municipality.*

Part 17 of the MGA entitled "Planning and Development" also sets out basic principles for water management that fall within the jurisdiction of the municipal government.

### *Basic Principles*

A municipality's jurisdiction over water bodies in section 60 is subject to "any other enactment," which includes the *Water Act*. The *Water Act* states that the property in and the right to the diversion and use of all water in the Province are vested in the Crown. Therefore, the jurisdiction and powers of municipalities set out in sections 60 and 61 and elsewhere in the MGA must be exercised within the context of the *Water Act*.

The planning provisions in Part 17 of the MGA remain much the same as under the *Planning Act* (RSA, 1980, c. P-9) with a few major changes.

Section 617, the purpose section, allows planning for the development and use of land and to maintain and improve the quality of the physical environment. It also introduces the concept of infringement of rights "to the extent that is necessary for the overall greater public interest." Municipal jurisdiction over water bodies in section 60 would apply to allow for water management planning, again subject to any other enactment. The reference in section 617 to "physical environment" makes environmental matters a relevant consideration when municipalities are making decisions on such matters as municipal development plans, land use bylaws, and subdivision or development approvals.

Municipalities with a population over 3,500 must produce a municipal development plan (the Plan) consistent with *Provincial Land Use Policies* (see section D.3.2). These policies, as currently drafted, include provisions for municipalities to take measures to protect water bodies and natural riparian habitat to the extent necessary for the "overall greater public interest."

The Plan must address:

- future land use
- the manner of and proposals for future development in the municipality
- the coordination of land use, future growth patterns and other infrastructure with adjacent municipalities if there is no intermunicipal development plan with respect to those matters in those municipalities
- the provision of the required transportation systems either generally or specifically within the municipality and in relation to adjacent municipalities

- the provision of municipal services and facilities either generally or specifically.

The Plan may also address:

- proposals for financing and programming municipal infrastructure
- the coordination of municipal programs relating to the physical, social and economic development of the municipality
- environmental matters within the municipality
- the financial resources of the municipality
- any other matter relating to the physical, social or economic development of the municipality.

The plan may contain statements of development constraints. In addition, the plan must identify the location of sour gas facilities and must contain policies respecting the provision of municipal and school reserves.

All subsequent municipal statutory planning documents must be consistent with the municipal development plan.

A municipality must pass a land use bylaw. As in previous legislation, "a land use bylaw may prohibit or regulate and control the use and development of land and buildings in a municipality."

Water bodies and adjacent lands are protected as environmental reserves. In section 664 (1) municipalities may require the owner of a parcel of land that is the subject of a proposed subdivision to provide part of that parcel of land as environmental reserve if it consists of:

- a swamp, gully, ravine, coulee or natural drainage course
- land that is subject to flooding or is, in the opinion of the subdivision authority, unstable
- a strip of land, not less than 6 metres in width, abutting the bed and shores of any lake, river, stream or other body of water for the purpose of:
    - preventing pollution or
    - providing public access to and beside the bed and shore.

The ability of a municipality to require land for an environmental reserve only comes into play during a decision on a subdivision. It does not generally exist elsewhere.

These provisions may not grant a municipality jurisdiction to protect the water bodies as a natural resource, except to prevent pollution. This uncertainty has led to different practices. Some municipalities limit their authority to pollution issues, while other municipalities take a less restrictive view of what they can regulate. Also, protection of riparian habitat is not included and therefore cannot be used as justification for taking of environmental reserves.

A municipality also has general powers under section 7 (a) and (c) that could be used to deal with various environmental concerns. These powers are:

> 7. *A council may pass bylaws for municipal purposes respecting the following matters:*
>
> (a) *the safety, health and welfare of people and the protection of people and property...*
> (c) *nuisances, including unsightly property.*

### Administration

The majority of the province is formed into various types of municipalities, which are governed by elected municipal councils. The authority of these elected councils is provided by the MGA and other legislation. In large urban municipalities, sections 60 and 61 of the MGA are dealt with by engineers and legal departments. In smaller, rural municipalities, often the chief administrative officer and public works employees deal with these provisions. It will become increasingly important for all municipal councils and the administrative bodies of municipalities to familiarize themselves with the ramifications of the new sections in the current MGA and the *Water Act*.

### Influence on Water Management

Municipal statutory plans and land use bylaws may contain policies respecting the impact of the development and use of land on water bodies. Lakes may be subject to municipal lake management plans. Lake management plans have been developed by some municipalities in the province. Primary authority for protection of water resources, however, remains with the provincial and federal governments. Fisheries, for example, are protected by the *Fisheries Act*, which is, in part, administered by Alberta Sustainable Resource Development.

It is not clear to what extent municipalities are limited in the ability to protect water from the impact of land development. General powers contained in sections 7, 60, 61, and 617 are broad, but may not be directly applicable to issues like stormwater management. The more specific powers in section 664 are more directly applicable to water bodies, but may be restricted to issues such as stability and pollution. The *Subdivision and Development Regulation* (AR 212/95), section 7, outlines the requirements for a subdivision authority to consider stormwater collection and disposal as part of the review of a subdivision application.

The municipal development plan could be used to protect water within a municipality. As the MGA clearly states that (subject to other provincial legislation such as the *Public Lands Act* and the *Water Act*) all natural water bodies are under municipalities' direction, control and management, municipalities should be expected to ensure that appropriate management of the resource is undertaken.

### *Who Could Be Affected*

Most Albertans live within municipalities that are governed by the provisions of the MGA. Therefore, if the direction, control and management of water is within the jurisdiction of municipalities, most persons in Alberta could be affected. Section 61 (subject to other provincial legislation such as the *Public Lands Act* and the *Water Act*), might enable a fee to be charged in relation to the use of the water body. It is not clear to what degree municipalities can use section 61 to collect fees and what fees could be collected.

### *Authority to Issue Approvals*

Municipalities have some authority to impose restrictions on land use to better protect the water resources through planning sections in the MGA, e.g., clauses that authorize prevention of pollution and provision of public access. The planning provisions and regulations governing planning could be used in conjunction with the environmental legislation that protects the quality of water. The new *Water Act* will work in conjunction with the MGA to manage the allocation and use of water.

### *Enforcement Procedures*

Each municipality with a population over 3,500 must produce a municipal development plan under the MGA to reflect policies adopted by its council. All subsequent statutory planning documents must be "consistent with" the municipal development plan. Land use bylaws, which determine how different sectors of municipalities will be developed, must be consistent with the plan. The plan itself must be consistent with the *Provincial Land Use Policies,* which set out the provincial policy guidelines related to the natural environment and water resources.

Municipalities are subject to the *Environmental Protection and Enhancement Act* and the *Water Act,* which impose administrative penalties and offences for non-compliance with particular sections. These enactments make politicians, directors and chief administrative officers personally liable for offences under the respective enactments, subject to the due diligence defence. These two pieces of legislation ensure that municipalities do not pollute the water resources and that water use within municipal jurisdictions is licensed.

### Sources of Further Information

The MGA, subdivision regulations, and the *Provincial Land Use Policies* are available from:

Publication Services
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8
Tel: (403) 297-6251

The *Provincial Land Use Policies* are also available from:

Municipal Services Branch
Local Government Services Division
Alberta Municipal Affairs
17th Floor, 10155 – 102 Street
Edmonton, AB
T5J 4L4
Tel: (780) 427-2225
Fax: (780) 420-1016

A list of land use guidelines and sources of further information are provided in the *Guidebook* (see section H.22).

## E.3.6 *Plumbing Code Regulation* and *Private Sewage Disposal Systems Regulation*

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the *Guidebook* is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, and relevant approvals should be consulted for all purposes of interpreting and applying the law.

### *Background and History*

The regulation of plumbing and sewage disposal systems in Alberta began in 1937 to address concerns about communicable diseases. In 1957, the regulations were placed under the *Public Health Act*. On May 5, 1971, the Alberta Department of Labour, now Alberta Municipal Affairs, was given the responsibility of regulating water and wastewater plumbing within buildings at the same time as the *Clean Water Act* was enacted to regulate communal systems. The *Plumbing Code Regulation* and the *Private Sewage Disposal Systems Regulation* were adopted under the *Safety Codes Act* (RSA 2000, S-1). They apply to all plumbing within the property line, including septic tank and disposal systems.

### *Basic Principles*

The regulations specify the siting, design and operation of wastewater disposal systems for single family dwelling farmsteads or properties that are not subdivided, where the amount of wastewater being disposed of is less than 50 cubic metres per day and is contained on the property.

Any system that falls outside the above parameters is regulated under the *Environmental Protection and Enhancement Act* (see section E.3.2). The regulation of other plumbing components is not considered to be pertinent to the principles of water management, so will not be summarized in the *Guidebook*.

### *Administration*

The *Safety Codes Act* is administered by Alberta Municipal Affairs. The *Safety Codes Act* establishes the Safety Codes Council, a self-sufficient, statutory corporation. The Council certifies and designates safety codes officers (inspectors) in accredited municipalities and for accredited agencies to provide permitting and inspection services to municipalities, corporations, or the province.

### Influence on Water Management

These regulations ensure that private on-site wastewater disposal systems are sited and designed to prevent contamination of surface water and ground water. Water management or municipal development policies can also limit the location of residential development to prevent surface water and ground water contamination either through the use of enhanced clearance distances or the regulation of the type of disposal system that is acceptable. In some cases on-site disposal is prohibited (e.g., holding tanks are required where there is a high water table and pit privies, under the Alberta Building Code, are required to have a ventilated pit which is protected from surface water and ground water).

### Who Could Be Affected

Any property utilizing on-site disposal of wastewater could be affected by the regulations.

### Authority to Issue Approvals

All installations of private sewage disposal systems require a permit. These are issued by accredited municipalities and agencies, but disputes or questions concerning the legislation are handled by Municipal Affairs. There is a principle that any person applying for a permit may receive some type of disposal system under the regulation (for example, holding tanks may be permitted).

### Enforcement Procedures

Penalties are for construction of new on-site private sewage disposal systems without a permit, but systems that were installed without a permit prior to the legislation being enacted in 1971 are not subject to enforcement. Normally, an unpermitted system that is found to be contaminating the environment or creating a risk to public health is designated as a nuisance under the *Public Health Act* by a Public Health Inspector and Orders may be issued to prevent occupation of a building or to require upgrading of the disposal system.

## E.3.7 *Public Lands Act*

RSA 2000, c. P-40

**NOTE**

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### *Background and History*

The Government of Canada transferred its control of all of Alberta's natural resources to the Province of Alberta in 1930. Since then the *Public Lands Act* has provided for provincial ownership of Crown lands including the bed and shores of "all permanent and naturally occurring" water bodies and "all naturally occurring rivers, streams, watercourses and lakes." Similarly, the province also owns all the water in the province under the *Water Act* (see section E.3.8).

### *Basic Principles*

The *Public Lands Act* applies to land administered by Alberta Sustainable Resource Development. The Act provides comprehensive powers to the Minister for the administration, allocation and management of public land resources.

### *Administration*

Public Lands Division is responsible for the day-to-day land use decision-making and management of the public land in the settled area of Alberta. In the forested region of Alberta, e.g., Eastern Slopes, this function is provided by the Land and Forest Division.

Administration of the Act in both areas of the province (e.g., issuing formal dispositions on public land) is provided by the Land Administration Division of the Land and Forest Division.

The government may allocate an interest in or allow the use of public land by an individual for a specific purpose. The government may also place conditions on a disposition/permit or issue guidelines on how that public land may be used.

For further information contact:

Dom Ruggieri, Regional Director
301 Provincial Bldg.
4920 – 51 Street
Red Deer, AB
T4N 6K8
Tel: (403) 340-5451

### *Influence on Water Management*

Public Lands Division, through its Shoreland Management Program, strives to maintain the integrity of provincial water bodies in order that the resource values and public benefits from them are sustained. The program cooperates closely with Alberta Environment to ensure that shoreland resources are managed in an integrated way to effectively protect Alberta's water bodies. The success of the program is reliant on individuals taking responsibility for the resources they use. Although enforcement provisions are available, the main focus of the Shoreland Management Program is to develop public awareness of the value of shorelands and to educate users so that they become effective stewards over these areas. Consultative and extension services are available to the public, including a variety of information publications.

Due to the sensitive nature of shoreland resources, most activities on the bed or shores (i.e., public land) require some form of authorization from either Public Lands Division or Alberta Environment, or both. Conditions are placed on all authorizations (1) to ensure that compatible activities and resources are used properly, (2) to limit the chance of degrading aquatic and shoreland environments, and (3), where necessary, to mitigate, reclaim or restore an area where disturbance is unavoidable. Approved activities and development are monitored to ensure environmental standards are maintained.

Public Lands Division also has a role in municipal planning where Crown-owned water features are involved. Sec. 5(3)(e) of the *Subdivision and Development Regulation (Municipal Government Act)* requires subdivision authorities to refer applications for subdivision to the Deputy Minister responsible for the *Public Lands Act*. This must occur if the proposed parcel is bounded by or contains, wholly or partially, the bed and shores of a Crown-claimable water feature. The referrals are necessary to ensure that provincial resource management interests are addressed as part of the decision on the subdivision. Recommendations are often made for environmental reserve dedication.

As an affected landowner, Public Lands Division is often part of statutory planning exercises involving detailed subdivision planning, lake management, and broad land use issues. Again, these referrals ensure that any significant provincial resource management issues are considered as part of the land use planning process. Municipalities are encouraged to consult with and involve Public Lands Division as early as possible in the development of their planning initiatives involving Crown-owned resources.

### Who Could Be Affected

Agriculture users, industrial users (oil and gas, seismic, surface materials), forest industry, municipalities, and recreational users (e.g., individual cottage owners, residential, recreational and commercial property developers) may be affected by the *Public Lands Act.*

### Authority to Issue Approvals

Approval applications for activities on bed and shore are available from the Land Administration Division or any regional Public Lands Division, Alberta Environment, Land and Forest Division or Fish and Wildlife Division office. A single application form completed with requested documentation can be used to obtain required permits under both the *Water Act* and the *Public Lands Act.* The office at which the completed application is submitted becomes the client's "one-window" to government.

The application form *LS102 – Lakeshore/Water Body Modification* can be used for the following activities: Aquatic Vegetation Control, Bank Stabilization, Beach Reconstruction, Domestic Waterline Intake, Erosion Protection, Marina Development, Outfall Construction, Permanent Boat Launch, Permanent Pier, Reservoir Construction, Wetland Management (see the application package for more details).

Separate application processes are utilized for Pipeline Water Crossings (regulated) and Surface Material (Sand and Gravel) Operations. These may be obtained from Alberta Environment or any Public Lands Division office.

### Enforcement Procedures

Section 51(1) of the Act contains a general prohibition that no person shall do anything on public land that (1) may injuriously affect watershed capacity, (2) is likely to result in injury to the bed and shores of any river, stream, watercourse, lake or other body of water or land in the vicinity of that public land, or (3) is likely to result in soil erosion.

Any "unauthorized use" of public land, including the bed and shores of a watercourse or water body may be subject to a variety of penalties, including administrative penalties (fines), disposition cancellation, ministerial orders to restore/reclaim disturbed areas, or legal action/court imposed penalties.

### Sources of Further Information

The *Public Lands Act* is available from:

Publication Services
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8
Tel: (403) 297-6251

The following publications are available from your regional Public Lands Division office:

- *Guidelines for Lakeshore Use* (brochure)
- *Riparian Habitat* (brochure)
- *Protecting Your Shorelands* (brochure)
- *Lakefront Municipal Reserves* (brochure)
- *Caring for Shoreline Properties: Changing the Way We Look at Owning Lakefront Property in Alberta*
- *Caring for the Green Zone: Riparian Areas and Grazing Management* (booklet).

## E.3.8 *Water Act*

RSA 2000, c. W-3

**NOTE**

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### Background and History

The *Water Act* of Alberta has roots that extend back to 1894. In that year, to provide secure water rights for irrigation, the federal government passed the *North-West Irrigation Act*. From 1894 to 1930, when water was under federal control, many important water licences were issued, particularly for municipal water supply, irrigation, and the generation of hydro-electric power.

In 1930, the federal government agreed to transfer ownership of natural resources to Alberta. As part of the agreement, Alberta was required to respect water licences that had been issued prior to that time. The only exception allows the province to change former federal licences with the consent of the licensees or by legislation that applies generally to all licences. In March 1931, Alberta passed the *Water Resources Act*, which essentially duplicated existing federal legislation.

On January 1, 1999, the *Water Act* replaced the *Water Resources Act*. The *Water Act* is intended to change water management from strict allocation of resources to conservation and management guided by the goal of sustainable development. Development of the *Water Act* began in 1991 and included public consultation across the province. The *Water Act* contains many principles that can be traced back to the original 1894 legislation.

## Basic Principles

Government control of water is assured by a declaration, which dates back to 1895, that the property of all the water within the province is vested in the Crown. In 1962, crown ownership of water was expressly extended to ground water.

The Act covers virtually all actions that affect water or water use management.

### *Water Use*

The Act prohibits the diversion or use of water except under the authority of the Act, the regulations, or a licence, registration, or approval issued under the Act. Some exemptions are provided in the Act:

- People who are owners or occupants of land adjoining a natural water body are allowed to divert water for household purposes. The definition of "water body" includes wetlands and ground water aquifers. The number of households on the land served with water can be limited by ministerial order or an approved water management plan. Because of its importance, household use of water has priority over all other uses.

- The *Water Act* respects licences issued under previous legislation as long as those licences are in good standing. These older licences (called "deemed licences") are subject to the Act. However, if a term or condition in the licence is inconsistent with the Act, the term or condition will prevail. The priority of deemed licences remains the same.

- If a decision has not been made on a complete application for a permit, licence, or other authority under the *Water Resources Act*, the application will be processed toward a decision as if the *Water Resources Act* were still in force.

The *Water Act* allows registrations to be used to protect traditional uses of water for agriculture. Traditional agriculture uses are raising animals and application of pesticides. A registration is available for up to 6,250 cubic meters (approximately five acre feet) of water per year or a greater amount if specified in an approved water management plan.

The process for obtaining a registration is streamlined and voluntary. A registration is available for traditional agriculture uses occurring prior to the legislation coming into force. A registration "grandfathers" the right to use water according to the date when the water was first used. A registration is appurtenant to the land specified in the registration. An application for a registration must have been made by January 1, 2002.

### *Water Management*

The Act contains broad powers to prevent impacts on water and water management. It stipulates that, unless authorized under the Act, no one can carry out an activity that:

- affects or could affect the flow, level, or location of water or its direction
- causes or could cause siltation or erosion or an effect on the aquatic environment.

The activities that may require an approval include dykes, erosion control, and streambank modification (pipelines, telecommunication lines and watercourse crossings are regulated under Codes of Practice). Activities requiring an approval are generally those carried out in the river, on its banks, or in the floodplain of a river.

The acquisition of licences, priorities during times of shortage, and transfers are discussed in greater detail under "Authority to Issue Approvals."

The Act also authorizes the province, if in the public interest, to construct, operate, maintain, repair, and take over works. The $4 billion of water resources infrastructure owned by the province is governed by the *Water Act*. This network includes 1,400 dams used to supply water to irrigation districts, reduce flood damage, and make water available for domestic, municipal, and industrial use.

The Act prohibits the bulk export of water to the United States and prohibits any new inter-basin transfers of water.

### Administration

The Act provides a streamlined, one-window licensing and approval process for water-related activities and diversions. The Act is administered by the Minister of Environment. Application for approvals and licences are made to Alberta Environment. Those documents are issued by a person authorized by the Minister as a "Director" under the Act. The day-to-day supervision of water users is conducted by inspectors and investigators. They are authorized to examine any works, make conclusive determinations in disputes over the quantity of water diverted by water users, and ensure compliance with the Act.

To achieve sustainability of Alberta's water use, the Act requires that a provincial water management planning framework be completed within three years after proclamation of the Act. As required by the Act, the *Framework* includes a strategy for protecting the aquatic environment. The Framework for Water Management Planning was released in December 2001.

### Influence on Water Management

The *Water Act* has influence over human activities that affect the quantity of water in the Bow River Basin. Questions of water quality are regulated by the *Environmental Protection and Enhancement Act* (see section E.3.2). Except for exempted activities, diversions, and household use, no one can legally affect water or water use management without a licence, approval, or other form of authorization.

### Who Could Be Affected

The act governs all those who divert water or affect its flow in any way. Similarly, the Act governs those who undertake any work in or around a water body that may affect water.

### Authority to Issue Approvals

The Act prohibits people from diverting or using water or carrying on an activity that affects water unless they first obtain a licence, approval, registration, or other form of authorization.

Licences are used to authorize the diversion or use of water for a variety of purposes including municipal water supply, power generation, industrial or irrigation use. Licences can be issued for the purpose of implementing a water conservation objective. A water conservation objective is the

- amount and quality of water established by the Director to be necessary for the
  - protection of a natural water body or its aquatic environment,
  - protection of tourism, recreational, transportation or waste assimilation uses of water, or
  - management of fish or wildlife.

A water conservation objective licence may only be issued to the Government.

In addition, the Minister may also grant a licence for the temporary diversion of water. There is a one-year time limit for temporary diversion licences.

The licence system governs all consumptive uses of water. Three features of its operation (acquisition of licences, allocating water in times of shortage, and transfers) require examination.

#### *Acquisition of Licences*

The acquisition of water licences in the Bow River Basin is governed by the *South Saskatchewan Basin Water Allocation Regulation*. Under the Regulation, an applicant can be issued a licence for water for a limited set of purposes. Implementing a water conservation objective is not among the uses listed.

Any person who wishes to acquire a licence must apply to the Minister of Environment. The applicant must provide public notice of the application unless the requirement is waived.

From this point, different procedures are employed. Applications for non-irrigation purposes are dealt with using the procedures set out in the *Water Act*, which apply to the allocation of water elsewhere in the province. Applications for irrigation are subject to additional requirements.

Applications for Non-Irrigation Licences: Applications to use water for purposes other than irrigation are submitted to the Director, who has the discretion to decide whether or not to issue a licence. The date on which a complete application is submitted to the Director is the basis for the priority number of the licence, if issued. A licence authorizes the operation of the project and diversion of water for the period of time the licence is in effect. Proper completion of the project and acquisition of right-of-way and agreements for the works are required.

In making a decision whether or not to issue a licence, the Director must consider the matters and factors specified in an applicable approved water management plan. The director may also consider:

- existing, potential or cumulative
  - effects on the aquatic environment
  - effects on household users, traditional agriculture users, and licensees
  - hydraulic, hydrological and hydrogeological effects that result from the proposed diversion
- effects on public safety
- other applicable matters including any applicable water guidelines, water conservation objective, or water management plan.

Irrigation Licences: The Regulation limits the amount of acres that can be used for irrigation from the Bow River.[10] Excluding irrigation districts, the amount of water allocated for irrigation from the Bow River Basin must not exceed the water sufficient for the irrigation of 95,000 acres. Of this amount, water is reserved for the irrigation of 15,000 acres in the Blackfoot (Siksika) Indian Reserve, 20,000 acres in the Little Bow/Clear Lake Project, and 10,000 acres in the Keho/Barons North Project. Within irrigation districts, the amount of acres allocated for irrigation must not exceed the amount sufficient for the irrigation of land specified in Table E.3.

The Regulation allows an increase in the amount of irrigated acres through improved efficiencies within a district. This has allowed the limit for the Eastern Irrigation District to be increased from 275,000 to 286,000 acres.

In addition to the matters and factors listed above, the Director may also consider the suitability of the land for irrigation.

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[10] Irrigation limits have also been established for the Red Deer, Oldman, and South Saskatchewan River Basins. Some of the water from the Bow River Basin is used for irrigation in the Oldman and Red Deer River Basins.

**Table E.3 Irrigation District Expansion Limits**

| Area | Total Area of Land (acres) |
|---|---|
| Bow River Basin | |
| Western Irrigation District | 95,000 |
| Bow River Irrigation District | 210,000 |
| Eastern Irrigation District | 286,000 |

*Allocation of Water in Times of Shortage*

Licensees have the right to use the quantity of water stipulated in the licence under the terms and conditions set out in the licence. If a shortage of water exists (so that there is insufficient water to satisfy the requirements of all licensees), the Act allocates water according to the principle of priority in time. The earliest licensee is entitled to receive the entire quantity of water stipulated in his/her licence before the next licensee can receive any water at all. The second licensee has similar rights against the third licensee and so on. This scheme is enforced, if necessary, by requiring licensees to shut off their diversions in reverse order of seniority.

The Act enables the Lieutenant Governor-in-Council in an emergency to suspend diversion of water or any approval, preliminary certificate, licence, or registration, and to designate the purposes for which, and the volumes of which, water may be diverted and used. Any licensee or registrant affected by such an order is entitled to compensation for losses incurred.

*Transfer of Licences*

As a general principle, the rights held under a licence are not transferable. Licences are appurtenant to the land or undertaking to which they are attached. However, there are two methods by which a person can acquire the rights held by a licensee.

(a) A person who acquires property also acquires any licences that have been issued in respect of that property. The new owner can continue to use water for the purpose set out in the licence.

(b) An application may be made to the Director to transfer an allocation of water under a licence. The intent behind the transfer of licenced allocations is to allow for flexibility in areas where new licences are not being issued or an applicant wants greater security of supply than provided by a new licence. The applicant must have the written consent of the licensee and the owner of the land or undertaking, if different from the licensee.

The Director must conduct a public review of a proposed transfer. An application for transfer may only be considered if:

- the licence is in good standing
- the licence is not a licence for temporary diversion of water or the result of a previous transfer where the allocation is to revert back to the original owner
- the ability to transfer has been authorized in
    - an applicable approved water management plan or
    - an order of the Lieutenant Governor-in-Council (Provincial Cabinet).

In assessing an application for transfer, the Director considers the same issues as when issuing a licence. The Director may also consider:

- existing, potential or cumulative effects on water conservation objectives and
- historical diversion under the licence.

The Director may approve a transfer only if:

- the volume in the licence is not exceeded
- the transfer does not impair the rights of household users, traditional agriculture users, or other licensees, and
- the transfer will not cause a significant adverse effect on the aquatic environment.

The *Water Act* provides the ability for the Government to withhold up to 10% of the water that is being transferred. The ability to holdback a portion of the allocation must be authorized in an approved water management plan or through an order of Cabinet. The holdback of water is applicable to both permanent and temporary transfers of allocations.

The *Water Act* also provides for agreements to assign water. Specifically, a licensee or traditional agriculture user may, for a period of time set out in an agreement, temporarily assign all or part of the water that the user is entitled to divert under the licence or registration to another licensee or traditional agriculture user. This agreement is subject to various conditions as outlined in the *Water Act*.

### Enforcement Procedures

The Act encourages cooperation and proactive measures to resolve water management problems and provides a wide range of enforcement measures where necessary.

Subject to the exemptions provided in the Act (e.g., traditional agriculture use, household use), any person who diverts or uses water without a licence or fails to obtain an approval for an activity is guilty of an offence. The maximum punishment for an individual is $100,000 and/or two years imprisonment and for a corporation $1,000,000. If a person gains monetarily from committing an offence under the Act, a fine may be imposed equal to the benefit gained. No one can be convicted if, on the balance of probabilities, the person took all reasonable steps to prevent the offence.

The Act also provides for the supervision of licences. A licence can be suspended or cancelled if, among other things:

- the licensee did not divert any water or failed or ceased to exercise the rights granted under the licence (over a period of three years) and there is no reasonable prospect that the licensee will do so
- a significant adverse effect on human health or public safety occurred, occurs, or may occur that was not reasonably foreseeable when the licence was issued
- (with compensation) a significant adverse effect on the aquatic environment occurred, occurs, or may occur that was not reasonably foreseeable when the licence was issued.

### Sources of Further Information

Barton, B. *Water Rights in Alberta*, Canadian Institute Seminar, *Western Canadian Environmental Law and Practice*, (1988), p. G-1.

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Percy, D. *The Institutional Creation of Water Shortages on the Canadian Plains*, Proceedings of the Symposium on Interbasin Transfer of Water (1987), National Hydrology Research Centre/Canadian Water Resources Association.

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Percy, D. *Water Rights in Alberta* (1977) 255 Alberta Law Review 142.

Percy, D. *Water Rights Law and Water Shortages in Western Canada*, The Rawson Academy of Aquatic Sciences, Toronto, 1986, 11 Canadian Water Resources Journal.

*Water Act*, Revised Statutes of Alberta, 2000, Chapter W-3, Queen's Printer Bookstore, Main Floor, McDougall Centre, 455-6 Street SW, Calgary, Alberta T2P 4E8, Tel: (403) 297-6251.

## E.3.9 *Wildlife Act*

RSA 2000, W-10

**NOTE**

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The Act vests the property of all live wildlife in Alberta in the Crown, except for certain captive wildlife, and addresses the protection of endangered species. The Act makes provisions for licences and permits, for the determination of hunting seasons, prohibits the sale of access to any land for hunting (s. 49) and sets out the powers of enforcement officers. Under the Act (s. 97), the Lieutenant Governor-in-Council (the provincial Cabinet) may make regulations respecting the delegation of administrative functions. The Minister may make regulations for the establishment, control, and management of wildlife sanctuaries and habitat development areas. The Minister may also place reservations on specified areas to restrict the type or timing of certain activities to protect habitat to reduce wildlife harassment.

Wildlife, game bird, seasonal, and corridor sanctuaries, along with restricted areas for game bird hunting and wildlife control areas, have been established to protect certain species in particular locations. Habitat conservation areas protect indigenous habitat or areas being restored or enhanced for wildlife. No hunting or trapping is allowed in wildlife sanctuaries without specific approval. Regulations prohibit entering wildlife control areas and seasonal sanctuaries and human activities are restricted in habitat conservation areas. There are nine designated wildlife and game bird sanctuaries in Alberta, eleven corridor wildlife sanctuaries, four habitat conservation areas and two wildlife control areas. Wildlife sanctuaries and habitat development areas could be established to protect and enhance wetlands as wildlife habitat.

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996)

For further information, contact:

Pat Dunford
Regulations Coordinator
Natural Resources Service, Alberta Sustainable Resource Development
Main Floor, South Tower, Petroleum Plaza
9915 – 108 Street
Edmonton, AB
T5K 2G8
Tel: (780) 427-4277
Fax: (780) 422-9560

# F. Treaties, Agreements, and Other Legal Arrangements

## F.1 *International Biodiversity Convention*

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the Guidebook is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original convention and other relevant documents should be consulted for all purposes of interpreting and applying the Convention.

The United Nations' *Convention on Biological Diversity* was signed over the period June 5, 1992, to June 4, 1993, by many countries, including Canada. The Convention commits the countries to "the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources." In the Convention, biological diversity is defined as "the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

By signing the Convention, the countries demonstrated their awareness and support for the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components. The provisions of the Convention apply in areas within the limits of national jurisdiction and, in the case of processes and activities, regardless of where their effects occur, both within and beyond the areas of national jurisdiction.

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NOTE: The term *water management* includes a wide variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

The Convention covers all means of ensuring biological diversity, including requiring:

- strategies, plans or programs for the conservation and sustainable use of biological diversity
- identification of components of biological diversity important for its conservation and sustainable use
- monitoring of biological diversity
- identification of processes and activities which have or are likely to have adverse impacts
- in-situ conservation methods (e.g., protected areas, management of biological resources, promotion of development that is sustainable, restoration of degraded ecosystems, managing alien species)
- ex-situ conservation methods, predominantly for complementing in-situ measures (e.g., establish and maintain facilities for conservation of and research on plants, animals and micro-organisms)
- sustainable use of components of biological diversity
- economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity
- research and training
- public education and awareness
- access to genetic resources
- access to and transfer of technology
- handling of biotechnology and distribution of benefits
- financial support and incentives for national activities intended to achieve the objectives of the Convention
- exchange of information
- technical and scientific cooperation.

For a copy of the *International Biodiversity Convention*, contact:

Audrey's Books Ltd.
10702 Jasper Avenue
Edmonton, AB
T5J 3J5

Tel: (780) 423-3487
Toll free: 1-800-661-3649
Fax: (780) 425-8446
E-mail: audrey@audreysbooks.com

or call the Canadian Government Publishing Sales Desk:
(819) 956-4800

For further information on how the *International Biodiversity Convention* is being implemented and on biodiversity in general, visit these websites:

| | |
|---|---|
| Environment Canada | http://www.ec.gc.ca |
| Natural Resources Canada | http://www.nrcan.gc.ca |

## F.2 Boundary Waters Treaty

**NOTE**

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The *Boundary Waters Treaty* is between the United States and Canada. It was signed on January 11, 1909. The Treaty requires that generally each country pass an agreed-upon portion of the natural flow of the St. Mary River and the Milk River. The St. Mary River is part of the South Saskatchewan River Basin and, therefore, its flow must be taken into account when managing the apportionment of water among the prairie provinces.

The Treaty established the International Joint Commission to oversee the administration of the Treaty. In Canada, the volumes of water passing interjurisdictional boundaries are determined from continuous flow monitoring stations operated by Environment Canada.

For a copy of the *Boundary Waters Treaty*, contact:

Audrey's Books Ltd.
10702 Jasper Avenue
Edmonton, AB
T5J 3J5

Tel: (780) 423-3487
Toll Free: 1-800-661-3649
Fax: (780) 425-8446
E-mail: audrey@audreysbooks.com

or call the Canadian Government Publishing Sales Desk:
(819) 956-4800

For a short history of the creation of the *Boundary Waters Treaty*, see

http://www.parkscanada.phc.gc.ca

## F.3 Riparian Rights

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the Guidebook is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legal sanction and is intended for general information purposes only. Judicial decisions and other relevant documents should be consulted for all purposes of interpreting and applying riparian rights.

### *Background and History*

When agricultural settlement first began in Alberta, the water law was derived from the English law of the time. At that time, only those who owned land adjoining a watercourse (riparian owners) enjoyed rights to water and the use of water was restricted to riparian lands. The rights of a riparian owner were also enjoyed by those who leased the land.

Riparian owners could use water for domestic purposes, but otherwise were required to allow water to pass their land undiminished in quantity and unimpaired in quality. This principle prevented any major consumptive uses of water for non-domestic purposes since they would diminish the quantity of water in the stream and totally precluded the use of water on land that did not adjoin a watercourse. When government officials and others began to promote the potential for extensive irrigation in the southern prairies, it was decided that riparian rights would have to be curtailed.

One of the major purposes of the original *North-West Irrigation Act* was to prevent the existence of riparian rights from threatening irrigation schemes. However, the effect of that legislation and the present *Water Act* on riparian rights has remained contentious up to the present day. The opinions of courts which have considered the existence of riparian rights have covered the whole spectrum, from suggestions that riparian rights no longer exist to statements that recognize their continued validity.

### *Basic Principles*

Under the law that prevailed before the passage of the *North-West Irrigation Act*, riparian owners had three types of rights in addition to the right to use water for domestic purposes, the right to the continued flow of water, and the right to water quality. They were:

- the right of access to water
- the right of natural drainage
- the right of accretion.

The *Water Act* affects only the right to the flow of water and the right to domestic uses. The other aspects of riparian rights exist to the present day. Although the precise extent to which the rights to flow and domestic use survive in Alberta is controversial, the law can be summarized in three propositions:

- It is highly probable (but not certain) that a riparian owner no longer has the right to bring action if the flow of water is diminished by a diversion of water that is duly licensed under the *Water Act*.
- A riparian owner can probably bring an action to restrain an unlicensed diversion of water or a diversion that is made contrary to the provisions of a licence, for this right does not appear to have been taken away by the *Water Act*.
- A riparian owner probably retains the common law right to use water for domestic purposes on riparian land.

The riparian right to water quality appears to be preserved by the *Environmental Protection and Enhancement Act* (EPEA), which expressly does not affect common law rights. A riparian owner may thus be able to assert a right to water that is substantially unimpaired in quality against a person or company who is operating within the terms of an approval under EPEA.

### *Influence on Water Management*

The riparian rights that survive do not have a major impact on the management of water in the Bow River Basin. They do not interfere with the rights of licensees under the *Water Act* and any action by a riparian owner to restrain an unlicensed diversion would further, rather than frustrate, the purpose of the legislation. The riparian owner's right to use water for domestic purposes must be respected, but this right is recognized in the *Water Act* and the Act is already administered to ensure that this occurs.

### *Enforcement Procedures*

Legislation does not create procedures under which riparian owners may enforce their rights. Any enforcement must be undertaken by riparian owners through private litigation.

For further information on riparian rights, see:

Percy, D., *Water Rights in Alberta* (1977) 255 *Alberta Law Review* 142.

## F.4 Federal-Provincial and Interprovincial Agreements

### F.4.1 *Natural Resources Transfer Agreement*

**NOTE**

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#### *Background and History*

Water in Alberta was once entirely a federal responsibility. From the time of Confederation until 1930 the federal government controlled Alberta's natural resources and from 1895 owned the water within Alberta and the other prairie provinces. In 1930, through the *Natural Resources Transfer Agreement*, the federal government transferred ownership of most water and other natural resources within the boundaries of Alberta to provincial jurisdiction.

#### *Basic Principles*

The basic principle behind the *Natural Resources Transfer Agreement* was to provide Alberta and the other prairie provinces with the same constitutional rights over natural resources granted to the provinces originally created by Confederation.

#### *Administration*

Since the transfer of natural resources, Alberta has owned its water resources except for those that are found on federally-administered lands such as national parks and First Nations. Alberta's administration of water resources applies to federal lands as long as there is no conflict with federal laws and regulations.

#### *Influence on Water Management*

For information on how the *Natural Resources Transfer Agreement* influences jurisdiction over water, see section C on jurisdictional responsibilities.

### Who Could Be Affected

Under the *Natural Resources Transfer Agreement*, Alberta is obliged to honour trusts, leases, and other arrangements created by the federal government prior to the transfer of resources. In terms of water management, these obligations are probably limited to the licences and other authorizations granted under the *North-West Irrigation Act*, the former federal *Irrigation Act*, and the *Dominion Water Power Act*.

### Authority to Issue Approvals

Alberta may alter licences and other authorizations granted by the federal government prior to the transfer of resources if one of three criteria is met:

- the licence or authorization contains provisions that would have allowed the federal government to make the change
- all parties to the licence or authorization (excluding the federal government) agree to the change
- Alberta passes legislation that generally applies to all water licences and other authorizations.

For a copy of the *Natural Resources Transfer Agreement*, contact:

Audrey's Books Ltd.
10702 Jasper Avenue
Edmonton, AB
T5J 3J5

Tel: (780) 423-3487
Toll free: 1-800-661-3649
Fax: (780) 425-8446
E-mail: audrey@audreysbooks.com

or call the Canadian Government Publishing Sales Desk:
(819) 956-4800

## F.4.2 *Master Agreement on Apportionment* and the Prairie Provinces Water Board

NOTE

Although care was taken to ensure that information is accurate and up-to-date, the Guidebook is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original agreement and other relevant documents should be consulted for all purposes of interpreting and applying the agreement.

### *Background and History*

In 1948, Canada, Alberta, Saskatchewan, and Manitoba signed the *Prairie Provinces Water Board Agreement*. The agreement created the Prairie Provinces Water Board (PPWB), whose duties were to make recommendations on the best use of interprovincial waters and allocations of water among the provinces.

In 1969, the *Master Agreement on Apportionment* was signed. This agreement established a formula for sharing interprovincial waters, gave recognition to the issue of water quality, and provided the PPWB with the authority to study and consider water quality problems related to interprovincial waters.

In 1992, Schedule E to the *Master Agreement* was adopted which more clearly defined the PPWB's mandate in the management of the quality of water in interprovincial streams.

### *Basic Principles*

*Water Quantity*

The amount of water that Alberta can consume or otherwise withhold from the South Saskatchewan River system is limited by the terms of the *Master Agreement*. The Agreement allows Alberta to "divert, store or consume" from the river system each year, a volume of water equal to one-half of the natural flow of the South Saskatchewan River at the Alberta-Saskatchewan border. The remaining volume of flow must be allowed to pass downstream into Saskatchewan. The exception to this general rule is that Alberta is entitled to divert, store or consume a minimum of 2.1 million acre feet in any year. The effect of this exception is that during years when the volume of natural flow is less than 4.2 million acre feet (a rare occurrence), Alberta may pass less than half the natural flow to

Saskatchewan. If at any time during a year Alberta wants to divert, store or consume more than half the natural flow, a flow of 1,500 cubic feet per second (cfs) must be maintained at the Saskatchewan border.

The Agreement allows Alberta to consider the Red Deer River and the South Saskatchewan River (which meet in Saskatchewan near the Alberta border) as separate rivers or as one river in terms of apportionment. Alberta has opted to consider the two rivers as one.

The flow of these rivers is monitored and the natural flow at the border is estimated by the parties to the agreement.

### *Water Quality*

The mandate of the PPWB with respect to water quality is to foster and facilitate interprovincial water quality management among the parties that encourages the protection and restoration of the aquatic environment.

In Schedule E of the *Master Agreement*, the PPWB has established water quality objectives for interprovincial rivers. (See Tables F.1 and F.2 for the water quality objectives for the South Saskatchewan and Red Deer Rivers.) If as a result of human activities, the concentration of a chemical, physical, or biological variable in a river reach is not within acceptable limits, reasonable and practical measures will be taken by the appropriate government so that the quality of the water returns to acceptable conditions.

In those cases where trend analysis or an impact assessment indicates that water quality may deteriorate beyond acceptable limits, then the PPWB shall agree on the reasonable and practical measures that will be taken by the appropriate government to maintain acceptable water quality.

## Administration

The duties of the PPWB are to:

- review, collate and analyze streamflow
- review water quality problems
- develop recommendations on water matters
- promote the integrated development of water resources or interprovincial streams
- prepare reports on disputes on apportionment
- ensure that programs on water quantity and quality required for effective apportionment are coordinated
- monitor water quality and apply water quality objectives to transboundary streams.

### *Influence on Water Management*

The *Master Agreement* affects the Bow River Basin through the flow and quality requirements it imposes on the South Saskatchewan River.

For further information on the *Master Agreement* and the PPWB, contact:

Prairie Provinces Water Board
Room 300, Park Plaza
2365 Albert Street
Regina, SK
S4P 4K1

Tel: (306) 780-6042
Fax: (306) 780-6810

**Table F.1 Water Quality Objectives**
**South Saskatchewan River Reach: Highway #41 to Confluence with Red Deer River**

| Chemical, Physical or Biological Variable | Acceptable Limit or Limits |
|---|---|
| Arsenic (dissolved) | 0.05 |
| Barium (total) | 1.0 |
| Boron (dissolved) | 5.0 |
| Cadmium (total) | 0.001 |
| Chromium (total) | 0.011 |
| Copper (total) | 0.01 |
| Fecal Coliform | 100/100ml |
| Fluoride (dissolved) | 1.5 |
| Iron (dissolved) | 1.0 |
| Lead (total) | 0.02 |
| Manganese (dissolved) | 0.05 |
| Nickel (total) | 0.025 |
| $NO_2+NO_3$ (as N) | 10.0 |
| Selenium (dissolved) | 0.002 |
| Sulphate (dissolved) | 500. |
| Zinc (total) | 0.05 |
| Cobalt | 1.0 |
| Sodium Absorption Ratio (SAR) | 3.0 |
| Total Dissolved Solids | 500 |
| Vanadium (total) | 0.1 |
| Ammonia (total) | See Table F.3 |
| Lindane | 0.0001 |
| 2,4-D | 0.004 |
| 2,4,5-TP | 0.01 |
| Chlorophenols (total) | 0.001 |
| Cyanide (free) | 0.005 |
| Mercury in Fish (ug/g) | 0.5 |
| PCB in Fish (ug/g) | 2.0 |

Symbols:

- all units are in mg/L unless otherwise noted
- ug/g = micrograms per gram

## Table F.2 Water Quality Objectives
## Red Deer River Reach: Bindloss to Confluence with South Saskatchewan River

| Chemical, Physical or Biological Variable | Acceptable Limit or Limits |
|---|---|
| Arsenic (dissolved) | 0.05 |
| Barium (total) | 1.0 |
| Boron (diss) | 5.0 |
| Cadmium (total) | 0.001 |
| Chromium (total) | 0.011 |
| Copper (total) | 0.004 |
| Fecal Coliform | 100/100ml |
| Fluoride (dissolved) | 1.5 |
| Iron (dissolved) | 0.3 |
| Lead (total) | 0.007 |
| Manganese (dissolved) | 0.05 |
| Nickel (total) | 0.025 |
| $NO_2$+$NO_3$ (as N) | 10.0 |
| Selenium (dissolved) | 0.001 |
| Sulphate (dissolved) | 500. |
| Zinc (total) | 0.03 |
| Cobalt | 1.0 |
| Sodium Absorption Ratio (SAR) | 3.0 |
| Total Dissolved Solids | 500 |
| Vanadium (total) | 0.1 |
| Ammonia (total) | See Table F.3 |
| Lindane | 0.0001 |
| 2,4-D | 0.004 |
| 2,4,5-TP | 0.01 |
| Chlorophenols (total) | 0.001 |
| Cyanide (free) | 0.005 |
| Mercury in Fish (ug/g) | 0.5 |
| PCB in Fish (ug/g) | 2.0 |

Symbols:
- all units are in mg/L unless otherwise noted.
- ug/g = micrograms per gram

### Table F.3 Total Ammonia Nitrogen

Total Ammonia Nitrogen (mg/L)

NOTE: The toxicity of ammonia relates primarily to the unionized form ($NH_3$). The concentration of unionized ammonia present in water increases with pH and temperature. The values below represent total ammonia-nitrogen concentrations (at various temperatures and pH levels) above which accompanying $NH_3$ concentrations may be harmful to aquatic life.

Total Ammonia ($NH_3$ + $NH_4$+)
(Maximum levels expressed as N at various pH and temperature conditions)

|  | Water Temperature (°C) |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| pH (pH units) | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| 6.50 | 2.06 | 1.97 | 1.81 | 1.81 | 1.22 | 0.85 | 0.60 |
| 6.75 | 2.06 | 1.97 | 1.81 | 1.81 | 1.22 | 0.85 | 0.61 |
| 7.00 | 2.06 | 1.97 | 1.81 | 1.81 | 1.22 | 0.85 | 0.61 |
| 7.25 | 2.06 | 1.97 | 1.81 | 1.81 | 1.23 | 0.86 | 0.61 |
| 7.50 | 2.06 | 1.97 | 1.81 | 1.81 | 1.23 | 0.87 | 0.62 |
| 7.75 | 1.89 | 1.81 | 1.73 | 1.64 | 1.15 | 0.81 | 0.58 |
| 8.00 | 1.26 | 1.18 | 1.13 | 1.09 | 0.76 | 0.54 | 0.39 |
| 8.25 | 0.72 | 0.67 | 0.64 | 0.62 | 0.44 | 0.32 | 0.23 |
| 8.50 | 0.40 | 0.39 | 0.37 | 0.37 | 0.26 | 0.19 | 0.15 |
| 8.75 | 0.23 | 0.22 | 0.21 | 0.22 | 0.16 | 0.12 | 0.09 |
| 9.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.11 | 0.08 | 0.06 |

## F.5 Wastewater Approvals in the Bow River Basin

**NOTE**

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The City of Calgary's wastewater approval is highlighted in this section because it is the major wastewater discharge approval in the basin.

A variety of other wastewater approvals have been issued to industries and municipalities in the Bow River Basin.

For further information about wastewater approvals in the Bow River Basin, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

## F.5.1 City of Calgary Effluent Discharge Approval

The discharge of treated wastewater by the City of Calgary into the Bow River is governed by an approval issued under the *Environmental Protection and Enhancement Act*. The City's two wastewater treatment plants covered by the approval are the Bonnybrook Plant and the Fish Creek Plant.

Following expansion in 1994, the Bonnybrook Plant has an average design capacity of 500,000 $m^3$/day and uses the most recent technology in biological nutrient removal and ultraviolet disinfection.

The smaller, but also unique in design, Fish Creek Plant has an average design capacity of 72,000 $m^3$/day and provides tertiary treatment for phosphorus removal and ultraviolet disinfection.

Details on effluent discharge limits for the two plants are shown in Tables F.4 and F.5. The City's approval also addresses stormwater and snow disposal.

For further information about the City of Calgary's management of wastewater, contact:

Plant Engineer
Wastewater Treatment Plants
City of Calgary Tel: (403) 268-3855

### Table F.4 Bonnybrook Wastewater Treatment Plant
### Limits to Treated Wastewater
### Terms, Conditions, and Requirements Attached to Approval

| Parameters for Treated Wastewater Prior to Discharge to the Bow River | Limit |
|---|---|
| $BOD_5$ - Biochemical Oxygen Demand<br>BOD measures the amount of oxygen consumed by aquatic organisms in the degradation of organic material, which in turn relates to the strength of organic material. | $\leq$ 20 mg/L monthly arithmetic mean of daily composite samples |
| TSS - Total Suspended Solids | $\leq$ 20 mg/L monthly arithmetic mean of daily composite samples |
| Fecal Coliforms<br>Fecal coliforms are those bacteria of the coliform group that reside in the gut of warm-blooded animals and are used as indicators of bacterial and viral contamination. | $\leq$ 200/100 ml monthly geometric mean of daily grab samples |
| Total Coliforms<br>Total coliforms are a group of bacteria collectively used as indicators of pollution, particularly bacterial and viral contamination. | $\leq$ 1000/100 ml monthly geometric mean of daily grab samples |
| Total Phosphorus as P<br>Phosphorus in the form of phosphate is an essential plant nutrient and in excess causes a proliferation of nuisance weeds. | $\leq$ 1 mg/L monthly arithmetic mean of daily composite samples |
| Ammonia-N: October 1 to June 30<br>Ammonia-N is toxic to aquatic life in low concentrations. | $\leq$ 10 mg/L monthly arithmetic mean of daily composite samples |
| Ammonia-N: July 1 to September 30<br>Ammonia-N is toxic to aquatic life in low concentrations. | $\leq$ 5 mg/L monthly arithmetic mean of daily composite samples |
| NB: The Director may review, after five years of operation, the need for further reduction of Ammonia-N concentration to 6 mg/L during the months of November to April and 3 mg/L during the months of May to October.<br>The above limits are deemed acceptable concentrations for the assimilative capacity of the Bow River without disturbing the present aquatic balance. | |

### Table F.5 Fish Creek Wastewater Treatment Plant
### Limits to Treated Wastewater
### Terms, Conditions, and Requirements Attached to Approval

| Parameters for Treated Wastewater Prior to Discharge to the Bow River | Limit |
|---|---|
| BOD$_5$ - Biochemical Oxygen Demand<br>BOD measures the amount of oxygen consumed by aquatic organisms in the degradation of organic material, which in turn relates to the strength of organic material. | $\leq$ 20 mg/L monthly arithmetic mean of daily composite samples |
| TSS - Total Suspended Solids | $\leq$ 25 mg/L monthly arithmetic mean of daily composite samples |
| Fecal Coliforms<br>Fecal coliforms are those bacteria of the coliform group that reside in the gut of warm-blooded animals and are used as indicators of bacterial and viral contamination. | $\leq$ 200/100 ml monthly geometric mean of daily grab samples |
| Total Coliforms<br>Total coliforms are a group of bacteria collectively used as indicators of pollution, particularly bacterial and viral contamination. | $\leq$ 1000/100 ml monthly geometric mean of daily grab samples |
| Total Phosphorus as P<br>Phosphorus in the form of phosphate is an essential plant nutrient and in excess causes a proliferation of nuisance weeds. | $\leq$ 1 mg/L monthly arithmetic mean of daily composite samples |
| NB: The above limits are deemed acceptable concentrations for the assimilative capacity of the Bow River without disturbing the present aquatic balance. | |

## F.6 Water Licences in the Bow River Basin

**NOTE**

Although care was taken to ensure that information is accurate and up-to-date, the Guidebook is only a guide to point you in the right direction. All persons making use of this summary are reminded that it has no legislative sanction and is intended for general information purposes only. The original legislation, regulations, licences, and other relevant documents should be consulted for all purposes of interpreting and applying these licences.

Under the *Water Act*, the old *Water Resources Act* and, prior to 1930, under federal legislation, many licences for the use of water in the Bow River Basin were issued. The main purpose of this section is to summarize the major licences in the Bow River Basin that have been issued. A synopsis of other licences is included in Tables F.6, F.7, and F.8 (see section F.6.5).

## F.6.1 Major Irrigation Licences

Three irrigation districts hold licences on the Bow River.

### *Bow River Irrigation District (BRID) Licence*

The first BRID licence dates back to an original application in 1908 and entitles the BRID to divert up to 380,000 acre feet annually for irrigation and domestic purposes. Of this amount, the BRID has the right to divert 150,000 acre feet with priority from October 27, 1908, 150,000 acre feet with priority from March 25, 1913, and 80,000 acre feet with priority from June 25, 1953. This licence estimates that the diversion will result in a return flow of 100,000 acre feet, but does not create an obligation to achieve that figure.

The BRID also has a licence to divert an additional 70,000 acre feet of water annually for irrigation purposes. The priority date for this licence is February 5, 1992. A condition of this licence is that diversion from the Bow River to supply this licence can only take place when the instream objectives for the reach between the Carseland-Bow River Headworks Weir and Bassano Dam are being met.

### *Eastern Irrigation District (EID) Licence*

The EID licence dates back to an application by its predecessor, the Canadian Pacific Railway Company, on August 1, 1903. Under the licence, the EID is authorized to divert from the Bow River 562,000 acre feet of water during the irrigation season for the purpose of irrigating 281,000 acres of land, more or less, within the district. The diversion may be made at the rate of 3,000 cubic feet per second (cfs) when the river is at flood stage, 3,000 cfs when the river is at high water stage, and 1,000 cfs when the river is at low water stage. In addition, the EID is entitled to divert a quantity of 200,000 acre feet during the non-irrigation season (October 1 to April 30) at a rate of up to 825 cfs. At all times, diversions by the EID must not reduce the quantity of water flowing through the Bassano Dam to less than 100 cfs.

### *Western Irrigation District (WID) Licence*

The WID licence dates back to an application made by its predecessor, the Canadian Pacific Railway Company, on August 1, 1903. A licence issued by the province in 1963 authorizes the WID to divert 160,400 acre feet for the irrigation of an area of 50,000 acres within the district. The WID may divert at the rate of 750 cfs for twenty-four days while the river is at flood stage, 600 cfs for fifty-three days when the river is at high water stage, and 400 cfs for seventy-six days when the river is at low water stage.

The 1963 licence reduced the WID's previous licence, issued by the federal government in 1921. The 1921 licence authorized the WID to divert 627,178 acre feet for the irrigation of 220,000 acres within the WID at diversion rates of 2,260 cfs for seventy-seven days when the river is at flood and high stages and 2,067 cfs for seventy-six days when the river is at low water stage. The WID disputes the legal ability of the province to have reduced the diversion without authorization from the district, because the WID does not believe that it provided consent with regard to the 1963 licence. A court action has commenced to determine which licence is valid.

### F.6.2 Major Municipal Licences

The City of Calgary is by far the largest municipal user of water in the Bow River Basin. It holds a series of licences, which entitle the City to divert water in the following fashion:

- The City of Calgary has a licence that entitles the City to divert up to 114,000 acre feet annually from the Bow River at a rate of 130 cfs for urban water supply purposes. Of this amount, 4,500 acre feet have priority from August 2, 1895 and 109,500 acre feet have priority from November 29, 1971.

  The City also has a licence with priority from November 2, 1981 to divert up to 171,000 acre feet annually from the Bow River at a rate of 126 cfs for urban water supply purposes.

- The City has the right to divert from the Elbow River up to 88,000 acre feet annually for the purpose of urban water supply, of which 54,000 acre feet has priority from October 24, 1929 and 34,000 acre feet has priority from November 25, 1971. The diversion is to be made at various rates based on the flow conditions in the Elbow River as stipulated in the licence. The rates of diversion are: 450 cfs when the river is at flood stage, 74 cfs when the river is at high stage, and 37 cfs when the river is at low stage.

## F.6.3 Provincial Projects Licences

The provincially-owned water resource projects on the Bow River are the Western Headworks and the Carseland-Bow River Headworks. They are operated under separate licences.

The two provincial projects on the Highwood River (Women's Coulee Diversion and Little Bow Diversion) are currently operated under licences and operating guidelines.

### Bow River Diversions

*Western Headworks Licence*

The Western Headworks are operated in accordance with the licence issued to the Minister of Environment in December 1973. Alberta Environment is authorized to divert up to 200,000 acre feet of water annually at a rate not to exceed 2,000 cfs from the Bow River to serve the Western Irrigation District and other licences.

*Carseland-Bow River Headworks Licence*

This licence was issued in 1996 with two priority dates: October 27, 1908 and June 25, 1953. The purpose of this licence is to divert, impound, and release water for water management, water supply (including irrigation), flow regulation, conservation, and recreation. Subject to meeting various conditions, Alberta Environment is allowed to divert water from the Bow River at Carseland at a rate of 1,200 cfs and an additional 260 cfs with a priority of 1908 and 1953 respectively.

The total system-wide live storage specified in the licence is 495,100 cubic decametres (401,500 acre feet) at full supply level.

### Highwood River Diversions

*Women's Coulee Diversion* (also called the Highwood Diversion)

The original licence for this project was issued to the Department of Public Works to divert 20 cfs for domestic purposes. The project was repaired and improved at various times between 1949 and 1979. The Province of Alberta undertook major rehabilitation in 1979. The licence for this project is for 60 cfs out of which 25 cfs has an October 5, 1933 priority and 35 cfs has a July 26,1979 priority. The purpose of this licence is to divert, impound and release water for water management, fold control, erosion control, flow regulation, conservation and recreation.

This system and the Little Bow Diversion are operated according to the licence utilizing "operating guidelines."

*Little Bow Diversion*

In 1899, the first authorization for this diversion was given to the government of the North West Territories of Canada to divert 50 cfs. The first diversion works were relocated and expanded later to a capacity of 100 cfs. The Province of Alberta took over the system in 1950 and has been operating the system since then.

## F.6.4 Water Power Licences

The Bow River upstream of Calgary is subject to a number of water power licences. The rights to water held under these licences are the most complex in the basin. Many of the licences were first granted by the federal government to Calgary Power. The administration of most licences has since been transferred to the Province of Alberta. Three licences (for Lake Minnewanka and the Cascade Power Station and the Horseshoe Falls and Kananaskis Falls Power Developments on the Bow River) remain under federal administration. All licences have been assigned to TransAlta Utilities Corporation, the successor to Calgary Power. The licences have also been subject to specific statutes and to agreements between the province and the licensee.

The Province of Alberta has consolidated all of TransAlta's water power licences. The consolidation incorporates previous statutes and agreements. The purpose of the consolidation was to simplify administration and ensure that the water rights are clearly documented. The consolidation received the approval of the Lieutenant Governor-in-Council in 1998.

### Ghost Licence

This licence was issued in 1947, but it dates back to an original federal interim licence that was issued in 1929. It grants to TransAlta the right to the flow of the Bow River at the Ghost site to use and store water for water power. Storage is limited to a maximum capacity of 73,000 acre feet at a full supply level (FSL) of 3,910 feet above sea level. The licensee is required to take all necessary and reasonable precautions, to the satisfaction of the Minister, while maintaining and operating the works, for the adequate protection from diminution, pollution, or otherwise of the water supply of the City of Calgary derived from the Bow River. The Minister may order the licensee to maintain a minimum flow of 4,600 cfs in the Bow River immediately below the Ghost plant for up to ten days during June and July when water can be beneficially used for irrigation rights granted prior to May, 1949 (provided that this does not require total releases greater than 20,000 acre feet). The Ghost Licence has been assigned a priority date of November 5, 1927.

### Interlakes Licence

This licence was issued in 1947 and dates back to an authorization granted in 1931. The licence entitles the licensee to store and use the waters of Upper Kananaskis Lake and the streams flowing into it, and the waters of the Kananaskis River up to a maximum capacity of 101,000 acre feet at an FSL of 5,583 feet above sea level. The Interlakes Licence has been assigned a priority date of September 12, 1930.

### Barrier Licence

The Barrier Licence was granted in 1949 and dates back to an interim licence granted in 1947. It entitles the licensee to store and use the waters of the Kananaskis River at the Barrier site up to a maximum capacity of 20,100 acre feet at an FSL of 4,515 feet above sea level. The summer operating level of the reservoir must be no greater than 4,513 feet above sea level. The Barrier Licence has been assigned a priority date of August 6, 1945.

### Spray Licence

This licence was issued in 1961 and dates back to an interim licence that was originally granted in 1949. It entitles the licensee to impound, store, and use, at the Spray site, for power and storage purposes, the headwaters of Smith-Dorrien Creek that are feasible to divert and the waters of the Spray River and their tributaries. The licensee may store such water in the Spray Reservoir up to an elevation of 5,570 feet above sea level or such other elevation as the licensee may determine to be the economic maximum. The licensee also agrees that it will not, by works outside the boundaries of Banff National Park, reduce the flow of water in the Spray River at its junction with the Bow River to an amount less than 200 cfs during the months of June, July, and August in each year. An understanding with Banff National Park has modified this provision. Under the current operating policy, TransAlta maintains a release of 5 to 10 cfs into the Spray River year round, and a minimum flow of 10 cfs and a maximum target of 30 cfs in Goat Creek. The Spray Licence has been assigned a priority date of May 14, 1948.

### Bearspaw Licence

This licence was issued in September 1961 and dates back to an interim licence granted in 1953. It entitles the licensee to divert, store, and use the waters of the Bow River at the Bearspaw site up to a maximum elevation of 3,579 feet above sea level in order to develop power and energy. A minimum elevation of 3,570 feet above sea level applies, except in an emergency and with the agreement of the City of Calgary. The Bearspaw Licence has been assigned a priority date of November 7, 1952.

### Pocaterra (Lower Kananaskis Lake) Licence

This licence was issued in 1961 and dates back to an interim licence that was granted in 1954. It entitles the licensee to impound and store at the Pocaterra site, for power and storage purposes, all the waters of Kent Creek and Pocaterra Creek that are feasible to divert and the Kananaskis River and their tributaries up to a capacity of not less than 51,100 acre feet. The licensee may store such water in the reservoir (Lower Kananaskis Lake) up to a full supply level of 5,469 feet above sea level or such other elevation as the licensee may determine to be the economic maximum. The Pocaterra Licence has been assigned a priority date of December 31, 1931.

### Cascade (Lake Minnewanka) Licence

The Cascade Licence was issued in 1947 and dates back to an original interim licence that was issued in 1942 to store in Lake Minnewanka the entire flow of rivers and streams entering the lake, including water augmented by the Ghost River Diversion and to divert, take, and use the stored water. The maximum storage of the lake is set at 200,000 acre feet with a maximum elevation of 4,840 feet above sea level and a minimum elevation of 4,805 feet except during emergencies when the minimum elevation can be reduced to 4,801 feet. The licensee is required to maintain a minimum flow in the Cascade River to meet the needs of Banff National Park between April 1 and September 30 in each year.

### Kananaskis Licence

This licence was issued in 1946 and entitles the licensee to take, divert, and use for power purposes all the waters of the Bow River at the Kananaskis Falls site. The licensee is required not to raise the level of water in the Bow River by releases to a level higher than that fixed by the Minister.

### Horseshoe Licence

The Horseshoe Licence was issued in 1946 and entitles the licensee to take, divert, store, and use for power purposes all the waters of the Bow River at the Horseshoe Falls site. The licensee is required to return all waters diverted from the Bow River to their ordinary channel in such a manner as not to lessen the volume of water in the channel. The licensee is also required not to raise the level of water in the Bow River beyond its ordinary high water mark at the easterly end of the second island below the Kananaskis Falls, which is five feet below the foot of Kananaskis Falls.

### Ghost Diversion Licence

This licence, which was issued in 1947, entitles the licensee to divert the entire flow of the Ghost River into Lake Minnewanka. The licensee's rights are also regulated by the conditions in the Cascade licence. The Ghost Diversion Licence has been assigned a priority date of December 13, 1940.

## F.6.5 Summary of Licences

### Surface Water

In the Bow River Basin, there are three licences issued by the federal government and over 1,000 licences issued by the provincial government for the diversion and/or use of surface water. The surface water licences are summarized in Tables F.6 and F.7.

Many licences for irrigation, municipal, and water power purposes were issued a long time ago. Modern licences in the Bow River Basin differ from their predecessors mainly in the respect that the licensee is now required to ensure that the diversion of water does not decrease the flow of the river or stream beyond a stated level.

**Table F.6 Summary of Surface Water Licences for Withdrawal Purposes Bow River Basin (Quantity < 10,000 acre feet per licence)**

| Purpose | Number of Licences | Total Quantity for all Licences in the Category (acre feet) |
|---|---|---|
| Agricultural | 566 | 6,515 |
| Diversion | 102 | 3,600 |
| Household | 23 | 4,083 |
| Industrial | 55 | 49,931 |
| Irrigation | 173 | 23,711 |
| Municipal | 60 | 19,242 |
| Storage | 63 | 14,275 |
| Other | 70 | 12,302 |
| Total | 1,112 | 133,659 |

**Table F.7 Summary of Surface Water Licences for Withdrawal Purposes Bow River Basin* (Quantity $\geq$ 10,000 acre feet per licence)**

| Purpose | Number of Licences | Total Quantity for all Licences in the Category (acre feet) |
|---|---|---|
| Irrigation | 5 | 1,409,895 |
| Municipal | 3 | 373,000 |
| Total | 8 | 1,782,895 |

* Excluded from this table are licences that do not contain a specific maximum quantity of wate. that can be diverted. These licences are the water power licences issued to TransAlta Utilities and the water rights created for most provincial projects.

### Ground Water

There are just under 500 ground water licences issued by the provincial government in the Bow River Basin. Table F.8 presents a summary of the ground water licences in the basin.

### Table F.8 Summary of Ground Water Licences for Withdrawal Purposes
### Bow River Basin

| Purpose | Number of Licences | Quantity (acre feet) |
|---|---|---|
| Agricultural | 246 | 3,737 |
| Diversion | 7 | 12,146 |
| Household | 28 | 200 |
| Industrial | 35 | 4,213 |
| Irrigation | 2 | 202 |
| Municipal | 94 | 7,030 |
| Storage | 5 | 423 |
| Other | 67 | 9,375 |
| Total | 484 | 37,326 |

For further information, contact:

Alberta Environment, Southern Region
2nd Floor, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-6582
Fax: (403) 297-2843

# G. Programs and Projects

## G.1 Alberta Cloud Seeding Project

This is an urban hail suppression project funded by the insurance industry in Alberta to reduce property damages caused by hail in the Calgary to Red Deer area. Hailstorms are seeded from June 1 to September 15 with silver iodide dispersed from aircraft by Weather Modification Inc. of Fargo, North Dakota, under contract to the Alberta Severe Weather Management Society.

For further information, see: www.weathermod.com

or contact:

Jim Renick, Project Director
Alberta Severe Weather Management Society
11 Warwick Drive
Red Deer, AB
T4N 0A1
Tel: (403) 347-1545
Fax: (403) 340-1340

## G.2 Alberta Environmentally Sustainable Agriculture (AESA) Program

### *Background*

The AESA program goal is to enhance adoption of environmentally sustainable practices by agriculture and food processing sectors. The AESA program builds on the successes of previous federal-provincial programs.

Funded by Alberta Agriculture, Food and Rural Development, the AESA program addresses a broad range of environmental issues including soil, water, air quality, and biodiversity. The program's priorities were established through stakeholder consultations. Funding for the AESA program is $5 million per year.

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NOTE: The term *water management* includes a wide variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

The AESA program provides funding and technical assistance to transfer new technology and information to farmers, ranchers and processors, enhance the adoption of environmentally sustainable practices, and monitor the impact of the agri-food industry on soil and water quality.

The AESA program is delivered through agricultural service boards, local and provincial producer organizations, aboriginal organizations, research institutes, processors, environmental organizations, and government organizations.

The AESA program has three components:

1. **Farm Based** – to assist agricultural service boards and agricultural, environmental, and aboriginal organizations to encourage better management practices by farmers and ranchers to reduce environmental impacts of primary production. This component has two elements: extension grants and provincial extension resources.

   For further information, contact:

   Carol Bettac, AESA Program Manager
   Alberta Agriculture, Food and Rural Development
   206, 7000 – 113 Street
   Edmonton, AB
   T6H 5T6 Tel: (780) 427-3885

2. **Processing Based** – to promote the development and adoption of practices and technologies by processors to ensure a more environmentally sustainable industry.

   For further information, contact:

   David Ritchie, Development Officer
   Alberta Agriculture, Food and Rural Development
   304, 7000 – 113 Street
   Edmonton, AB
   T6H 5T6 Tel: (780) 422-2556

3. **Resource Monitoring** – to monitor change in the quality of soil and water resources as affected by the agri-food sector. Monitoring is carried out in cooperation with other government agencies and industry partners.

For further information, contact:

Soil Resources

Tom Goddard
Alberta Agriculture, Food and Rural Development
206, 7000 – 113 Street
Edmonton, AB
T6H 5T6 Tel: (780) 427-3720

Water Resources

David Neilson
Alberta Agriculture, Food and Rural Development
206, 7000 - 113 Street
Edmonton, AB
T6H 5T6 Tel: (780) 427-3906

### Administration

The AESA program is directed by a council consisting of a cross-section of industry and stakeholder representatives. The Minister appointed the 29 members of the AESA Council from the list of names nominated from industry and stakeholder organizations. The membership of the Council reflects the broad range of the agricultural industry, including crop, livestock, and processing sectors. There are also representatives from environmental/wildlife organizations, the three levels of government, and key industry organizations, such as the Agriculture and Food Council. The AESA Council is supported by five regional committees and a processing-based committee.

The AESA Council has a four-part mandate:

- to identify and evaluate environmental challenges and opportunities facing the agriculture and food processing industry
- to encourage the industry to proactively address environmental issues
- to direct the AESA program
- to advise the Minister of Alberta Agriculture, Food and Rural Development on these issues.

The Council has the challenging and exciting role of helping the agri-food industry find ways to protect the environment while remaining competitive in world markets. With strong industry representation, the AESA Council takes an integrated approach to environmental challenges to ensure the program meets the needs of the industry in its search for improved environmental management.

## G.3 Alberta Water Management and Erosion Control Program (AWMECP)

### *Basic Principles*

Management of water resources and control of erosion are concerns faced by many local governments in Alberta. The Government of Alberta provides financial assistance to local authorities to assess or correct water and erosion problems. The program assists in undertaking corrective measures where water, in its natural state, creates conditions adverse to the public interest.

### *Administration*

The AWMECP is administered by Regional Services, Alberta Environment. When a local authority requests assistance, Alberta Environment staff will inspect the problem and advise on its eligibility for assistance.

Once a problem has been recognized as eligible, the local authority prepares a preliminary engineering report. This report provides a cost estimate and an assessment of the engineering, economic, and environmental aspects of the solution and recommends whether or not it should be implemented. The report is submitted to the local office of Alberta Environment and, if approved, an agreement is signed by the local authority and the Minister of Environment. The local authority then proceeds with detailed engineering and construction. Itemized accounts for eligible expenditures incurred, including the preliminary engineering report, are sent to Alberta Environment for payment of a grant amounting to 65% of the costs.

To be eligible for consideration, projects must fall within one of the following categories:

- Erosion Control
- Flow Regulation (e.g., lake stabilization, backflood irrigation, storage dams)
- Water-Based Recreation (e.g., community wharves and boat launches, man-made lakes)
- Fish, Waterfowl and Wildlife Enhancement
- Securing a Source of Water Supply
- Water Conservation Projects

The flood control aspects of AWMECP are being reviewed for inclusion in a new program.

Within this wide range of categories, projects must also:

- be in the public interest
- promote sound water management
- be initiated by the local authority
- have a demonstrated need
- be technically, environmentally and economically feasible.

Approved projects are shared between the province and the local authority on a 65%/35% basis, respectively, with the local authority assuming responsibility for costs associated with operation, maintenance and land acquisition.

### *Who Could Be Affected*

Any urban or rural municipality in Alberta can make a request for assistance to implement a water management or erosion control project. A user group with a project proposal that might be eligible under the program should contact their local municipality to apply for assistance on its behalf.

Detailed information is available through the offices of Alberta Environment in Calgary, Edmonton, Lethbridge, Peace River, Leduc, and Red Deer. For the Bow River Basin, contact the Calgary office:

Regional Services, Water Administration
Alberta Environment
2nd Floor, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-6582
Fax: (403) 297-2749
E-mail: Waterman.Account@gov.ab.ca

## G.4 Approval of Instream Activities

### *Basic Principles*

Government control of water is assured by a declaration, which dates back to 1895, that the property in all the water within the province is vested in the Crown. In 1962, crown ownership of water was expressly extended to ground water.

The *Water Act* covers virtually all actions that affect water or water use management.

The Act contains broad powers to prevent impacts on water and water management. It stipulates that, unless authorized under the Act, no one can carry out an activity that:

- affects or could affect the flow, level, or location of water or its direction
- causes or could cause siltation or erosion or an effect on the aquatic environment.

The Act is also used to allocate water for various uses, e.g., household, municipal, industrial, and agricultural.

### *Administration*

An approval allows a person to place a structure or material on, or alter the shoreline, banks, or bed of a water body in a manner that may affect water management. Common projects that require an approval are erosion protection, bank stabilization works, sand and gravel removal, channelization, brushing operations, and permanent docks. Activities requiring approval are generally those carried out in a watercourse, on its banks, or in the floodplain of a watercourse. An approval does not give a person the right to use water.

To obtain an approval, the first step is to submit a completed application. An application for an approval consists of:

- the application form itself, containing:
    - the name and address of the applicant
    - the legal description of the location of the proposed project
    - a list of other land or water which may be affected
    - other related information
- plans, reports, specifications and other data on the project. This information is required to evaluate the effect of the project on land and water.

Ordinarily, applications are dealt with on a first-come, first-served basis.

Completed applications including plans are reviewed by Alberta Environment. Among the points examined at this stage are:

- Ownership of land involved and consent of owners (applicants are encouraged to consult with neighbors and obtain the required consent).
- Effects of the development on land and water, as well as other projects.

- Views of other government agencies (e.g., Public Lands Division, Fish and Wildlife Management) that may be affected.

- Views of other authorities, groups, municipal governments, and others with a bona fide interest in the project.

- Public notice is required for all applications. The applicant is advised of the procedures to follow.

The aesthetics of a project are not specifically reviewed.

The terms and conditions are specified when the approval is issued. Generally, no other documentation is required from Water Administration. Some projects previously requiring an approval (e.g., bridges and pipeline crossings) are now regulated under Codes of Practice, namely, the Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body (effective April 1, 2000) and the Code of Practice for Watercourse Crossings (effective May 1, 2000). With the Codes in effect and upon notification to Alberta Environment, the activity may be undertaken without obtaining an approval. The activity must be carried out to comply with the objectives, standards, and conditions set out in the Codes. The person responsible has the duty to determine how best to achieve these objectives and standards. The Codes fall within the *Water Act* and its Regulations.

### *Enforcement Procedures*

The Act encourages cooperation and proactive measures to resolve water management problems and provides a wide range of enforcement measures where necessary.

Individuals and corporations in violation of the *Water Act* may face penalties as prescribed in the Act.

Application forms for an approval may be obtained from any office of Alberta Environment. The Calgary office is located at:

Alberta Environment
Southern Region
2nd Floor, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-6582
Fax: (403) 297-2749

Copies of the *Water Act* and accompanying regulations may be obtained from:

Queen's Printer Bookstore
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8
Tel: (403) 297-6251
Fax: (403) 297-8450
Internet: www.qp.gov.ab.ca/display_ acts.cfm

If proposed works occupy Crown land (i.e., the bed and shores of a water body), an authorization may be required under the *Public Lands Act*. For further information, see the "Guidelines for Lakeshore Use" brochure, available through local Public Lands Division or Water Administration offices or the Agriculture Publications Office in Edmonton at (780) 427-0391.

Approvals may also be required under federal legislation. For further information regarding the requirements of the *Fisheries Act* (Canada) please contact:

Habitat Management, Central and Artic Region
Department of Fisheries and Oceans
7646 8 Street NE
Calgary, AB
T2E 8X4
Tel: (403) 292-5160
Fax: (403) 292-5173

For further information regarding the requirements of the *Navigable Waters Protection Act* please contact:

Navigation Protection Program
Canadian Coast Guard
9021 – 46 Street
Edmonton, AB
T6B 3B2
Tel: (780) 495-3701

The City of Calgary also regulates activities occurring adjacent to watercourses within the City. For further information, please contact:

City of Calgary
City, Community & Downtown Planning Division
4th Floor South, Calgary Municipal Building
800 MacLeod Trail SE
P.O. Box 2100, Station M
Calgary, AB
T2P 2M5
Tel: (403) 268-5311

## G.5 Approvals – Water Quality Approvals

### Background and History

Approvals to carry out activities that may impact surface water quality or supply potable drinking water are an important component of Alberta Environment's (AENV) mandate. The process of applying for an approval and undergoing a public consultation process is described in the *Environmental Protection and Enhancement Act* (EPEA) and its regulations (see section E.3.2).

### Basic Principles

The Government of Alberta's environmental goal with respect to surface water is to protect, preserve and restore the water as close to its natural state as possible, and to permit the greatest number of uses within the constraints of ensuring surface water is protected and preserved. To achieve this environmental goal, the government has enacted EPEA, which prohibits the discharge of contaminants to the natural environment:

- in an amount, concentration or level or at a rate of release that is in excess of that prescribed by an approval or regulations, or
- in an amount, concentration or level or at a rate of release that causes or may cause a significant adverse effect.

The adequate supply of drinking water is a basic human requirement. The availability and quality of drinking water can have a significant impact on both the public health and the overall quality of life within a community. A major objective of AENV is to ensure that drinking water supplies and treatment systems provide a high level of public health protection while being able to meet the water supply needs of the community. With this in mind, AENV has adopted the following position regarding drinking water quality for communal water systems, which forms the basis for the development and delivery of the drinking water program in Alberta:

> Water for drinking, culinary and other domestic uses shall be safe, palatable and aesthetically appealing. It shall be free from pathogenic organisms and hazardous levels of chemical and radioactive substances. Other aspects, such as corrosivity, tendency to stain due to high iron or manganese concentrations, tendency to form encrustations, and excessive soap consumption due to water hardness, should be controlled on the basis of economic considerations since they can interfere with the intended domestic use of the water.

### Water Quality Management Philosophy

The Water Quality Management Philosophy includes the following:

- Pursue pollution prevention practices such as conservation, re-use, recycling, or the use of municipal bylaws to restrict or prohibit the type of waste to be released to a system.
- Containment or treatment of waste products utilizing "Best Practicable Technology" (BPT).
- The approved release of wastewater into a body of water should not exceed the water quality specified in the *Surface Water Quality Guidelines For Use in Alberta*. However, the water quality within a mixing zone may exceed the Guidelines but must be met at the boundary of the mixing zone. A mixing zone is an area surrounding or downstream of a source discharge of liquid effluent where the effluent mixes with the receiving water and is progressively diluted.
- Where the water quality in a water body does not meet the *Guidelines*, then further degradation will not be permitted. In the case of an existing release when a facility is expanded or upgraded, it should include all reasonable and practical measures to upgrade the water quality to the *Guidelines* by reducing the amount of wastewater released or improving wastewater quality. If it is demonstrated that all reasonable measures have been taken, then deviations may be allowed if:
    - upstream water quality exceeds limits due to irreversible human or natural induced conditions
    - attaining the *Guidelines* would result in substantial economic and social impacts
    - suitable pollution prevention techniques are not available.
- Development of drinking water quality guidelines is based on health risk assessment (undertaken by Health Canada). However, a federal-provincial committee sets the drinking water quality guideline limits (the province is represented on this committee by AENV). AENV will continue to work with Health Canada to develop sound, implementable drinking water guidelines and adopt these guidelines as quality standards through provincial regulations and approvals.

### Industrial Wastewater Approvals

Part 4, Division 1 of EPEA deals generally with the release of substances into the environment. Specific requirements are outlined in the Substance Release Regulation, Ozone Depleting Substance Regulation, Codes of

Practice and individual industrial approvals. The Activities Designation Regulations outlines which activities require an approval or regristration under EPEA.

Approvals issued to an industry normally encompass the management of the following: air emissions, industrial runoff, waste management, soil and ground water monitoring, potable water production for staff, and industrial and domestic wastewater management. Industrial and domestic wastewater and industrial runoff releases are governed by the terms and conditions outlined in the activity's EPEA approval.

### *Industrial Release Limits*

The document *Industrial Release Limits Policy (November 2000),* AENV, outlines the approach followed by AENV staff to develop industrial release limits for approvals under EPEA.

Industrial release limits are intended to protect the ambient environment and human health, and to ensure the most appropriate pollution prevention and control technologies are adopted.

Table G.1 shows the variety of industries that are regulated in Alberta.

**Table G.1 Summary of Industrial Categories in Alberta as of December 2001**

| Industry/Sector | Number of Active Facilities |
|---|---|
| Agriculture | 17 |
| Biotechnology | 1 |
| Electric Power systems | 61 |
| Gravel, Sand, and Clay Pits | 764 |
| Industrial Services | 5 |
| Building Products | 17 |
| Chemical Products | 100 |
| Food Products | 46 |
| Metals | 11 |
| Mineral Products | 8 |
| Petroleum & Coal | 71 |
| Pulp and Paper | 8 |
| Wood Products | 58 |
| Oil & Gas Processing | 460 |
| Pipeline | 765 |
| Special Operation Classifications | 1209 |
| Waste Management Facility | 420 |

Note: Some facilities only have air emission criteria.

### *Technology Limits and Ambient Environmental Quality Based Limits*

To determine whether the appropriate level of pollution prevention and control technologies are adopted, two parallel assessments based on technology and the ambient environment are required. The results of these assessments are compared and the more stringent result is applied as a release limit. Release limits may be concentration limits, loading limits or a combination thereof.

The range of limits applied for certain industries is available in an AENV publication entitled *Summary of Alberta Industrial Wastewater Limits and Monitoring Requirements, June 1999*. The information presented in this document is subject to continuous change and should not be used to predict which limits or monitoring requirements may be imposed on new facilities or on facilities subject to approval renewals or amendments.

### *Municipal Wastewater Approvals*

Communal wastewater systems subject to approval include:

- a municipal development that consists of two or more lots that share a common wastewater system
- a privately owned development such as a mobile home park or school that:
    - is on a parcel of land that is not subdivided
    - is served by a wastewater system that
        - discharges off the site of the development, or
        - generates more than 50 $m^3$/day of wastewater, but does not include a single-family dwelling, farmstead or condominium development connected to a wastewater system for municipal development.

The approval requires that the wastewater system is designed and operated in accordance with the latest edition of the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems* published by AENV. Performance standards are outlined in Tables G.2 and G.3.

Wastewater lagoons are required to meet a design-based standard, which typically produces a treated effluent that meets secondary effluent quality criteria. They are considered an excellent method of treatment with only an annual release of treated effluent. This process can be further improved with wastewater irrigation of agricultural land.

Continuous discharging facilities on sensitive rivers such as the Bow River are required to employ enhanced secondary processes (also referred to as tertiary treatment) to reduce phosphorus, ammonia, and bacteria levels. The processes commonly used are biological nutrient removal and ultraviolet disinfection.

**Table G.2 Best Practicable Technology Standards For Municipalities with Current Population <20,000**

| Type | Parameter | Standard | Sample | Comments |
|---|---|---|---|---|
| Secondary | $CBOD_5$<br>TSS | 25 mg/L<br>25 mg/L | composite<br>composite | Monthly average of daily samples<br>Monthly average of daily samples |
| Aerated lagoons | $CBOD_5$ | 25 mg/L | grab | Monthly average of weekly samples |
| Wastewater lagoons<br>2 or 4 anaerobic cells (2-day retention time in each cell)<br>1 to 2 month facultative cell<br>1 to 2 month storage cell | Not defined | Not defined | Not defined | Lagoons built to the specified design configuration and drained once a year between late spring and fall do not have a specified effluent quality standard. Early spring discharges may be allowed under exceptional circumstances to comply with any local conditions. Discharge period should not exceed three weeks unless local conditions preclude this rate of discharge. |

$CBOD_5$ – Carbonaceous biochemical oxygen demand    TSS – Total suspended solids

Facultative cells – cells that can operate aerobically and anaerobically

## Table G.3 Best Practicable Technology Standards For Municipalities with Current Population >20,000

| Type | Parameter | Standard | Sample | Comments |
|---|---|---|---|---|
| Secondary treatment[1] | $CBOD_5$ | 20 mg/L | composite | Monthly average of daily samples |
| | TSS | 20 mg/L | composite | Monthly average of daily samples |
| | Total coliform | 1000/100 mL | grab | Geometric mean of daily samples in a calendar month |
| | Fecal coliform | 200/100 mL | grab | Geometric mean of daily samples in a calendar month |
| Enhanced secondary (also called tertiary treatment) | $CBOD_5$ | 20 mg/L | composite | Monthly average of daily samples |
| | TSS | 20 mg/L | composite | Monthly average of daily samples |
| | TP | 1 mg/L | composite | Monthly average of daily samples |
| | $NH_3$-N | - | composite | Need assessed on a site-specific basis |
| | Total coliform | 1000/100 mL | grab | Geometric mean of daily samples in a calendar month |
| | Fecal coliform | 200/100 mL | grab | Geometric mean of daily samples in a calendar month |
| Aerated lagoons | $CBOD_5$ | 20 mg/L | grab | Monthly average of weekly samples |
| | TP | 1 mg/L | grab | Monthly average of weekly samples |
| | $NH_3$-N | - | grab | Need assessed on a site specific basis |
| | Total coliform | 1000/100 mL | grab | Geometric mean of weekly samples in a calendar month |
| | Fecal coliform | 200/100 mL | grab | Geometric mean of weekly samples in a calendar month |
| Wastewater lagoons<br>2 or 4 anaerobic cells (2-day retention time in each cell)<br>1 to 2 month facultative cell<br>1 to 12 month storage cell | None defined | None defined | None defined | Lagoons built to the specific design configuration and drained once a year between late spring and fall do not have a specified effluent quality standard. Early spring discharges may be allowed under exceptional circumstances to comply with any local conditions. Discharge period should not exceed three weeks unless local conditions preclude this rate of discharge. |

$CBOD_5$ – Carbonaceous biochemical oxygen demand

TSS – Total suspended solids

TP – Total phosphorous

$NH_3$-N – Total ammonia

Facultative cells – cells that can operate aerobically and anaerobically

### *Stormwater Approvals*

Stormwater collection and disposal systems are included in wastewater approvals. Emphasis is placed on treatment of stormwater.

The AENV publication *Stormwater Guidelines* provides standards, guidelines, and a listing of acceptable best management practices (BMPs) for use in designing storm drainage systems.

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1. All communities >10,000 are at the enhanced secondary treatment level or are moving towards it (with the exception of Brooks).

The current objective is to remove at least 85% of sediments of particle size 75 µm or greater.

### *Waterworks Approvals*

Surface Water Source: A waterworks requires an approval if surface water is supplied to more than one residence. Typically, municipalities are the primary approval holders but private developments and institutions are also subject to the same criteria. Farmsteads are exempted.

The approval requires that the works are designed and constructed in accordance with the latest edition of the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems.* In the case of a waterworks system supplied by surface water, the treatment system must include (at a minimum) chemical pre-treatment (coagulant addition) with an aluminium-based salt, filtration, and disinfection. Full conventional treatment including coagulation, flocculation and sedimentation prior to disinfection is the preferred level of treatment. Disinfection with chlorine is required unless an alternative can be shown to be as effective. Other processes such as sedimentation or fluoridation may also be regulated through the approval process.

The approval includes limits for filtration rates as well as physical, chemical and bacteriological quality. Self-monitoring frequency is specified along with reporting requirements. Normally, the approval is for 10 years, however, extensions to water mains and changes in chemical coagulants may be made by applying for a letter of authorization. Modifications to the plant or treatment process require an approval amendment.

Each facility is classified based on a points system to assign a level for operator certification, which is also regulated by AENV.

Emergency situations such as water contamination require that the Regional Engineer be notified. The *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water for Alberta Environment Approved Systems* ensures the appropriate parties are notified in the event that bacteriological contamination is detected and outlines the required corrective actions. Consultation with the regional health authority could result in a "boil water" advisory issued by the authority or an emergency environmental protection order issued under EPEA by the Regional Director.

Ground Water Source: The approval procedure for a waterworks system supplied by a ground water source is identical to that for a waterworks systems supplied by a surface water source with the following exceptions:

- An approval is not required if the ground water system serves less than 15 residences or has less than 3 kilometres of distribution mains and the water does not require treatment to remove a constituent that exceeds health-related limits as specified in the latest edition of the *Guidelines for Canadian Drinking Water Quality*.

- Filtration is not typically required unless the ground water is found to be under the influence of surface water.

- Disinfection is typically required for all waterworks systems supplied by ground water to ensure the integrity of the distribution system.

- The system may be classified as a water distribution system only if there is no treatment other than disinfection.

### *Approvals for Pesticide Use Near Water Bodies*

Under the *Pesticide (Ministerial) Regulation*, Section 11, an approval is required for the use of pesticides under the following circumstances:

- application within or on an "open body of water"
- application by ground equipment (as opposed to aircraft) on cultivated land within 10 horizontal metres of an "open body of water"
- application by aircraft on any land within 30 horizontal metres of an "open body of water"
- application on non-cultivated land within 30 horizontal metres of an "open body of water"
- storage within 30 horizontal metres of an "open body of water"
- the washing of equipment or vehicles used to apply pesticide within 30 horizontal metres of an "open body of water."

An "open body of water" is defined in the *Pesticide Sales, Handling, Use and Application Regulation* and includes the bed and shore of any water body except the following:

- roadside ditches
- waterworks, wastewater or storm drainage systems
- water bodies completely surrounded by private land with no outflow beyond the private land and under 4 hectares in surface area
- water bodies on public land with no outflow and under 0.4 hectares in surface area

- irrigation and drainage canals that are completely surrounded by private land with no outflow beyond the private land
- dry streams having a bed and shore averaging 0.5 metres or less in width within the boundaries of the area being treated with pesticide.

"Bed and shore" is defined in the *Pesticide Sales, Handling, Use and Application Regulation* as land that is or has been covered by water to the extent that no vegetation grows on the land or that any vegetation present is aquatic in nature and must be partially submerged in water for part of its life cycle.

"Cultivated land" is defined in the *Pesticide (Ministerial) Regulation* as land that has been prepared to produce crops or livestock and includes pasture and improved range and privately owned land that produces turf and ornamental plantings.

### *Landfill Approvals*

A municipal or sanitary landfill that accepts more than 10,000 tonnes of waste per year or serves 10,000 persons or more is required to obtain an approval under EPEA. Landfills of this size with an existing permit under the *Public Health Act* are considered in compliance with the EPEA requirement to have an approval and have until 2006 or earlier to renew their approval depending on when it was issued. The new approval under EPEA will require ground water monitoring, surface runoff control, litter control, and reporting and monitoring for special wastes.

### *Codes of Practice*

Many facilities that have very little impact on water quality are regulated under codes of practice as of September 30, 1996. This means that an approval is not issued but the activity must be registered under EPEA and follow the applicable code. Code of Practice activities may still require an approval if they do not meet the criteria identified within the Code of Practice. The criteria for requiring a Code of Practice or an approval are specified in the *Activities Designation Regulation* under EPEA. Codes of practice include:

- *Code of Practice for Asphalt Paving Plants*
- *Code of Practice for Concrete Producing Plants*
- *Code of Practice for Compressors, Pumping Stations and Sweet Gas Processing Plants*
- *Code of Practice for Foundries*
- *Code of Practice for Small Fish Farms and Fish Processing Plants*
- *Code of Practice for Landfills*
- *Code of Practice for Composting*

- *Code of Practice for Discharge of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Natural Gas Pipelines*
- *Code of Practice for Hydrologic Tracing Analysis Studies*
- *Code of Practice for Small Meat Processing Plants*
- *Code of Practice for Tanker Truck Washing Facilities*
- *Code of Practice for Small Vegetable Processing Plants*
- *Code of Practice for Landfarming of Hydrocarbon Contaminated Soil*

### Administration

Water quality approvals under EPEA are administered by Alberta Environment, Regional Services (RS). All programs in the Bow Basin are carried out through the RS Southern Region office in Calgary.

### Who Could Be Affected

People who own, operate or work at facilities that have an EPEA approval, who live near these facilities or who drink potable water produced from EPEA approved waterworks facilities may all be affected by EPEA approvals. As standards are revised, new facilities that require an EPEA approval are required to meet these standards. Operating facilities already holding an EPEA approval are generally not required to improve their treatment systems to meet a new standard unless a public health problem is identified or the facility is undergoing an upgrade or renewing their approval.

### Enforcement Procedures

Enforcement shall take place in accordance with Parts 10 and 11 of EPEA. Specific penalties are listed in Section 214 and can range as high as $100,000 for an individual and/or 2 years imprisonment, and in the case of a corporation a fine of $1,000,000.

The most severe penalties are for conducting an activity without an approval, releasing a substance in excess of an approval limit, releasing a substance that may cause an adverse effect, knowingly providing false information, and knowingly contravening an approval, certificate, registration or enforcement order. Failing to provide information is also a serious offence.

An administrative penalty is a new enforcement tool under EPEA. It is a monetary amount assessed by the Manager of Enforcement and Monitoring when a person has contravened the Act or the regulations. The Manager may choose to impose an administrative penalty rather than commence a prosecution against a violator. The maximum penalty for each contravention is $5,000 per day that the contravention continues. A notice of an administrative penalty is issued requiring payment within 30 days. The notice may be appealed to the Environmental Appeal Board.

Enforcement principles and measures under EPEA are shown in Table G.4.

For further information, contact:

Alberta Environment
Southern Region, Environmental Assurance
203, 2938 – 11 Street NE Tel: (403) 297-7605
Calgary, AB Fax: (403) 297-5944
T2E 7L7 Internet: www.gov.ab.ca/env/info/infocentre

See also:
http://www3.gov.ab.ca/env/water/legislation/Approvals_Licences/ApprovalsAdminGuide.pdf

This guide explains ways to protect all permanent and intermittent natural surface water bodies throughout the province in rural and urban areas on private and public land. It defines activities that require approval under Alberta's *Water Act*, and provides for consistent application of the *Water Act* in both rural and urban areas.

Copies of the *Environmental Protection and Enhancement Act* may be obtained from:

Queen's Printer Bookstore
Publication Services
Main Floor, McDougall Centre
455 – 6 Street SW Tel: (403) 297-6251
Calgary, AB Fax: (403) 297-8450
T2P 4E8 Internet: www.qp.gov.ab.ca/display_ acts.cfm

**Table G.4**
**Enforcement Principles and Measures under the *Environmental Protection and Enhancement Act***

| Guiding Principles |
|---|
| ▪ Non-compliance will be met with an appropriate enforcement response.<br>▪ To achieve its stated objectives, Alberta Environment will not hesitate to use all components of enforcement action: education, remediation and deterrence.<br>▪ The public is encouraged to report environmental concerns and suspected contraventions of environmental legislation. Public complaints will be treated seriously and followed up.<br>▪ Legislated reporting of non-compliance is the cornerstone of enforcement activities. Failure to report an incident will result in stringent enforcement action.<br>▪ Enforcement will be firm but fair and carried out in a timely and consistent manner.<br>▪ Alberta Environment will take the lead role in enforcing environmental legislation.<br>▪ Delegation of enforcement authority to other agencies will be carried out in accordance with these principles. |
| **Enforcement Measures** |
| ▪ Investigations and inspections<br>▪ Warning letter<br>▪ Environmental protection order<br>▪ Emergency environmental protection order<br>▪ Injunctions to prevent a particular action from occurring<br>▪ Prosecution<br>▪ Administrative penalties may also be assessed for less serious offences such as failure to file a report. |

## G.6 Approvals – Water Quantity Approvals

### Background and History

Alberta has a major responsibility in the management of water because of the province's geographic position as custodian of the headwaters of some of the nation's most important watersheds. Water management decisions made in Alberta have far-reaching implications for present and future generations in the province and the rest of Canada.

The southern half of Alberta has approximately 15% of Alberta's water supply but 80% of the total water demand. Seasonal variations in flows also present additional challenges as stream discharge varies from early summer peaks to very low winter flows.

Rapid economic development and intensive urbanization, together with increased standards of living, have resulted in high demands for water and high expectations regarding its quality. The high demand for water has caused temporary shortages, particularly in Southern Alberta.

## Basic Principles

The principles that govern water quantity licensing are described in more detail in the section entitled Water Management – Vision and Principles (D.2.2) and the section on the *Water Act* (E.3.8). This section discusses how those principles are being implemented.

The water resources of Alberta are to be managed in support of the overall economic and social objectives of the province. The Government's commitment to a program of balanced economic growth, the general welfare of Albertans, and the present and future quality of life are overriding considerations in water management. The supply of good quality water should not be a limiting factor in achieving these economic and social goals.

### *Water Management Philosophy*

The water management philosophy involves better use of available water resources, augmentation of available water supplies where necessary, and reduction of consumption.

This philosophy is being realized by obtaining, from water resources, a maximum benefit for Albertans, while ensuring that the water is in a condition for beneficial use for an indefinite period and protecting the natural environment from the negative impacts of diversion and use of water.

### *Water Rights and Licensing*

Rights to divert and use water are granted under the *Water Act*. There are terms and conditions in water use licences designed to protect the source of supply and the rights of other water uses. A licensed water allocation remains valid as long as the specified use continues and may be cancelled for, among other things, waste, ceasing to exercise the allocation granted, or non-performance of a condition of the licence.

### *Preference of Use*

As basic water management policy, the Alberta Government recognizes the importance of water, first, for household purposes. All other uses (e.g., for food production and industrial use) are then equal and subject to the priority system.

### *Water Licences*

Water is allocated through a licence for the diversion and use of water. Licences are ranked according to their priority. The legislated procedure is that the licence priority is based on the "first in time, first in right" principle. The priority is determined by the date when a complete licence application is filed.

Water in the Bow River Basin is allocated according to the *South Saskatchewan Basin Water Allocation Regulation* (SSBWAR). For water from the Bow River Basin, the SSBWAR limits to 95,000 acres the total lands to be used for irrigation purposes outside the irrigation districts. Any licence issued in accordance with the SSBWAR may contain conditions limiting the amount of water that can be diverted and used when necessary to maintain minimum instream flows.

### *Surface Water Licences: Instream Requirements*

The concept of maintaining flows for instream uses is being expanded and strengthened. Fish resources in provincial waters are protected as an instream use of water.

In the Bow River Basin some surface water approvals have been issued subject to instream objectives being met before withdrawal of water can take place. Instream objectives are defined by one or a combination of the following:

- a minimum flow
- the flow(s) required to protect a specific purpose, e.g., to protect fish habitat or ensure proper dilution of sewage effluent.

Licences for instream uses cannot be issued under the SSBWAR.

### *Ground Water Approvals*

Ground water is recognised as an extremely valuable resource to individuals, farming operations, communities, businesses and industries.

A ground water approval provides the holder with a certain degree of protection as it:

- ensures that the location of the well and the amount of water being used are recorded with the department
- determines the priority of ground water use and competing uses during periods of ground water shortage.

Approvals are not required for:

- Wells equipped with hand pumps
- Household use
- Livestock operations not listed below.

Approvals are required for:

- Three households or more on the same well
- Agricultural
  - 150 or more head of mature beef (cattle, horses, bison)
  - 5,000 or more poultry
  - 100 or more sows in a farrow to finish operation
  - 1,000 or more feeder hogs
  - 200 or more mature sheep
- Irrigation – including greenhouses, tree/sod farms, parks, etc.
- Industrial – including water bottling, abattoirs, oil recovery, etc.
- Municipal – including communities, hauling points, subdivisions, etc.
- 3,000 gallons of water or more in any day for household and livestock use.

The applicant should begin by applying for and obtaining an approval to drill and explore for ground water since it is necessary to comply with the terms of the approval before formal application to use ground water can be made.

Appropriate terms for an approval to drill and explore for ground water and the need for public advertising of the project by the applicant are determined upon receipt of the completed application form.

The terms of the approval to drill and explore for ground water outline technical information, such as pumping test data, aquifer evaluation, long-term production capabilities, and the potential impact on surrounding ground water uses. This information is included with the application for the licence. It is the responsibility of the applicant to demonstrate that sufficient ground water is available for the project and that the diversion will not have an unreasonable effect on other ground and surface water uses in the surrounding area.

In situations where a water source well is completed in close proximity to a surface water body such as the Bow River or a lake, the applicant is also responsible for determining if a component of the water is originating from the surface water source. If there is evidence to suggest a hydraulic connection, consideration will be given to licensing as a surface water source rather than ground water source.

In Alberta, the municipal governments are charged with the task of approving new subdivision developments. During the approval process, many issues are reviewed and addressed, including road construction, types of residential housing, traffic, noise, concerns from the surrounding community, utilities, and pipelines. In some cases, this process may also include a review of water supply for the subdivision. Ground water is a common and relatively inexpensive source of water supply for many newly proposed subdivisions.

Under the *Water Act*, there is a requirement that, for ground water supply to a proposed subdivision, a detailed hydrogeological study must be completed by a ground water specialist who is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA). The report must address the potential impact on the source of supply and on other surrounding water users in the area. If the developer wishes to drill and complete individual wells for each lot in the proposed subdivision, section 23(3) of the *Water Act* requires that a detailed ground water report be submitted to the municipality for review. The report must clearly state that a minimum of 1,250 cubic metres per year can be diverted from each well without interfering with existing users in the community. The municipality will then consider such a water supply system as part of the overall approval for development under the *Municipal Government Act*.

If, however, the developer wishes to establish a central water well distribution system (one or two wells used for all the lots in the subdivision with annual production exceeding 1,250 cubic metres per year per well), the developer is required to first apply under the *Water Act* for a preliminary certificate. The preliminary certificate may outline water well testing requirements that must be included as part of the local ground water investigations. The report is then submitted to Alberta Environment for review and licensing under the *Water Act*. Typically, both levels of government will work together in coordinating the approvals under both the *Municipal Government Act* and the *Water Act*.

### *Master Agreement on Apportionment*

The *Master Agreement on Apportionment* is a federal-provincial agreement which, in general, requires Alberta (every year) to pass half of the natural flow of watercourses flowing into the Province of Saskatchewan.

## Administration

The water quantity approval program is administered by Alberta Environment (AENV).

### Who Could Be Affected

Prior rights and instream water requirements are an essential part of the decision-making process of granting licences. Depending on the source of supply, instream requirements and senior licensees, a given allocation may not be available at all times. The cumulative granting of licences over the years, however, affects the remaining water to be allocated, irrespective of the type of use or category of uses.

### Permitting Abilities

Reflecting AENV's policy of transferring more decision-making responsibility to the regions and supporting community level service, licensing of surface and ground water has been delegated to the regional offices.

### Enforcement Procedures

Enforcement will take place according to the *Water Act*. It is a violation for anyone to withdraw water, alter the flow of water, or otherwise alter a river, lake, or other body of water without the authority of a licence or other approval issued under the *Water Act* or previous legislation. See Table G.5 for enforcement procedures under the *Water Act*.

For further information, contact:

Surface and Ground Water Licensing

Alberta Environment
Southern Region
200, 3115 – 12 Street NE
Calgary, AB
T2P 7J2
Tel: (403) 297-6582
Fax: (403) 297-2749

See also:
http://www3.gov.ab.ca/env/water/legislation/Approvals_Licences/ApprovalsAdminGuide.pdf

This guide explains ways to protect all permanent and intermittent natural surface water bodies throughout the province in rural and urban areas on private and public land. It defines activities that require approval under Alberta's *Water Act*, and provides for consistent application of the *Water Act* in both rural and urban areas.

Copies of the *Water Act* may be obtained from:

Queen's Printer Bookstore
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8

Tel: (403) 297-6251
Fax: (403) 297-8450
Internet: www.qp.gov.ab.ca/display_ acts.cfm

**Table G.5 Enforcement Under the *Water Act***

| **Enforcement Objectives Under the *Water Act*** |
|---|
| ▪ Ensuring that the purposes of the Act are followed including protecting the water rights of all users.<br>▪ Monitoring of authorized projects for compliance with conditions of the authorization (licence or other approval).<br>▪ Ensuring that unauthorized works are rendered ineffective.<br>▪ Ensuring the stability of works constructed instream.<br>▪ Protecting the environment.<br>▪ Ensuring instream objectives are met.<br>▪ Protecting others from flooding. |
| ***Current Enforcement Techniques*** |
| ▪ Requesting compliance.<br>▪ Issuing an enforcement order to direct compliance with a preliminary certificate.<br>▪ Requesting and/or taking other steps to ensure compliance with the priority of a licence.<br>▪ Prosecution.<br>▪ Issuing an enforcement order to render works ineffective.<br>▪ Ministerial authorization for department staff and/or others to render works ineffective.<br>**Note: One or more of the above enforcement actions can be taken on each incident.** |
| ***General Process or Procedure for Enforcement*** |
| ▪ Complaints of alleged violations are investigated by regional staff.<br>▪ Depending on the results of the investigation, regional staff recommend and implement one of the above enforcement actions.<br>▪ Alberta Justice makes the decision as to whether a case proceeds to prosecution. |

## G.7 Banff National Park Management Plan

### *Background and History*

The Minister of Canadian Heritage announced the Banff-Bow Valley Study in March 1994 to examine the future of the Bow River watershed within Banff National Park. It had three major objectives:

- to develop a vision and goals for the Banff-Bow Valley that will integrate ecological, social and economic values;

- to complete a comprehensive analysis of existing information and to provide direction for future collection and analysis of data to achieve ongoing goals;
- to provide direction on the management of human use and development in a manner that will maintain ecological values and provide sustainable tourism.

After more than two years of extensive research, consultation and discussion, the Banff-Bow Valley Study was released. Many of its recommendations are incorporated in the Banff National Park Management Plan. The Plan guides what will be done in the Park for the next 15 years and lays the groundwork for more action afterwards.

### Basic Principles

The Plan emphasizes that Banff National Park is a place for:

- Nature
- People
- Heritage Tourism
- Community
- Environmental Stewardship

The Plan requires all Canadians to understand that the stresses and strains of human development cannot be allowed to injure the wild places Canadians are pledged to protect in Banff National. It requires open and transparent decisions that show foresight and prohibit human use whenever and wherever it can be demonstrated that such use will cause severe environmental consequences.

### Administration

The Banff National Park Management Plan is administered by Parks Canada.

### Influence on Water Management

In the past, the aquatic resources of Banff National Park have not received the same attention as terrestrial ecosystems. Human activities during the past 100 years have resulted in noticeable degradation of the ecological integrity of aquatic resources in the park. Many factors have contributed to this situation. These includes dams, controlled water levels, the introduction of non-native fish species, the release of nutrients and other chemicals into the water, instream disturbances as a result of construction, and the channelization of water bodies to reduce flooding.

The Plan identifies the following major concerns that must be addressed:

- the amount of phosphorous in the Bow River, particularly from wastewater treatment plants in the Hamlet of Lake Louise and the Town of Banff;
- the effects of fish stocking – native fish have not been able to compete with exotic species introduced to park waters.
- water regulation – more than 40% of the flowing waters in the Bow River watershed are regulated by dams;
- Lake Minnewanka – bull trout have almost disappeared from the lake as a result of extreme fluctuations in the water level, fish stocking, and fishing. Water level fluctuations have also destroyed typical shoreline vegetation and aquatic habitats. The diversity of fish and invertebrates in the lake has also decreased; and
- decreases in the amount of water released from the Lake Minnewanka and Spray Lakes reservoirs – this has altered the physical structure and biota of floodplains, the riparian system, and the aquatic systems of the Cascade and Spray Rivers.

The Plan identifies the following strategic goals:

- To maintain and, where feasible, restore natural flow regimes, water levels, and the biodiversity of aquatic ecosystems.
- To use selected aquatic systems within the park as ecological benchmarks.
- To maintain and, where necessary and feasible, to restore water quality to the highest possible standards, where human use of surface and ground water does not impair the ability of aquatic and riparian systems to support a full range of naturally occurring species, or the safety of water for human consumption or use.
- To demonstrate leadership in maintaining good water quality.
- To strive, over the long term, to achieve water quality standards that equate as closely as possible to the naturally occurring waters of the park.
- To restore natural water levels and flows in the Vermilion Lakes.
- To restore and maintain the natural biodiversity, age and distribution of vegetation in the Vermilion Wetlands in a way that reflects the influence of natural processes while still allowing public use and enjoyment.

For further information, contact:

Superintendent, Banff National Park
Box 900
Banff, AB
T0L 0C0

Tel: (403) 762-1510
Fax: (403) 762-1583

## G.8 Bow Basin Plan – A Water Management Strategy for the Future of the Bow River Basin

### Background and History

The flow and quality of water in the Bow River and its tributaries are sometimes not sufficient to satisfy all users, particularly in early spring and during late summer and fall. The quantity and quality of ground water vary substantially and, in some cases, do not meet people's needs.

Population and economic development in the basin (Map G.1) are increasing and more demands are being placed on the basin's water supply. There is an urgent need to reduce conflicts among water users and identify ways that water management can ensure continued prosperity and environmental quality.

The Bow River, its tributaries, and aquifers in the basin provide water for:

- domestic use
- industrial use
- effluent discharge
- municipal use
- water power
- recreation
- irrigation
- stockwatering
- ecosystem requirements such as habitat for fish and wildlife.

The ability to meet these requirements depends on a complex system of policies, laws, licences, approvals, and physical infrastructure such as dams and wastewater treatment plants. As well, the resources of the basin are protected and their use is managed by a number of jurisdictions, including the provincial government, Banff National Park, municipalities, First Nations, and irrigation districts.

### Basic Principles

The Bow Basin Plan will provide:

- better information
- improved analytical tools, and
- timely recommendations

for decisions related to water in the Bow River Basin. The plan is designed to meet the requirements of the *Water Act.*

The Bow River is part of the South Saskatchewan River Basin that Alberta shares with Saskatchewan. The use of water from the South Saskatchewan River is governed by the *Master Agreement on Apportionment* which, in general, requires half the natural flow to be passed on to Saskatchewan each year and sets objectives for the quality of water. Because of our commitments to Saskatchewan, the Bow River must be managed in concert with other parts of the South Saskatchewan River Basin.

### Administration

Alberta Environment provides management direction for the plan, in consultation with other government agencies and the public. The Bow River Basin Council (BRBC) is the public advisory committee.

The priorities for the plan are shown below. A wide variety of issues were considered in setting these priorities. Meeting the priorities depends on the participation and resource commitments of stakeholders.

**Priorities for the Bow Basin Plan**

**Current Priorities**

- Instream needs and objectives for:
    - Bow River from Ghost Dam to Bassano Dam
    - Elbow River
    - Kananaskis River
- Enhancement of water quantity modeling[2]
- Highwood Management Plan
- Water quality analysis downstream of Calgary

**Future Priorities**

- Instream needs and objectives for:
    - Bow River upstream of Ghost Dam
    - Sheep River
    - Fish Creek

### Influence on Water Management

The plan will provide a number of benefits. Better data, particularly on instream needs,[3] will mean decision makers have better information when they consider applications for water withdrawal, effluent discharge or when they change policies for operating facilities such as dams, weirs, and wastewater treatment plants. Water users, such as irrigators and recreationists, will be in a better position to represent their interests to governments and other members of the public.

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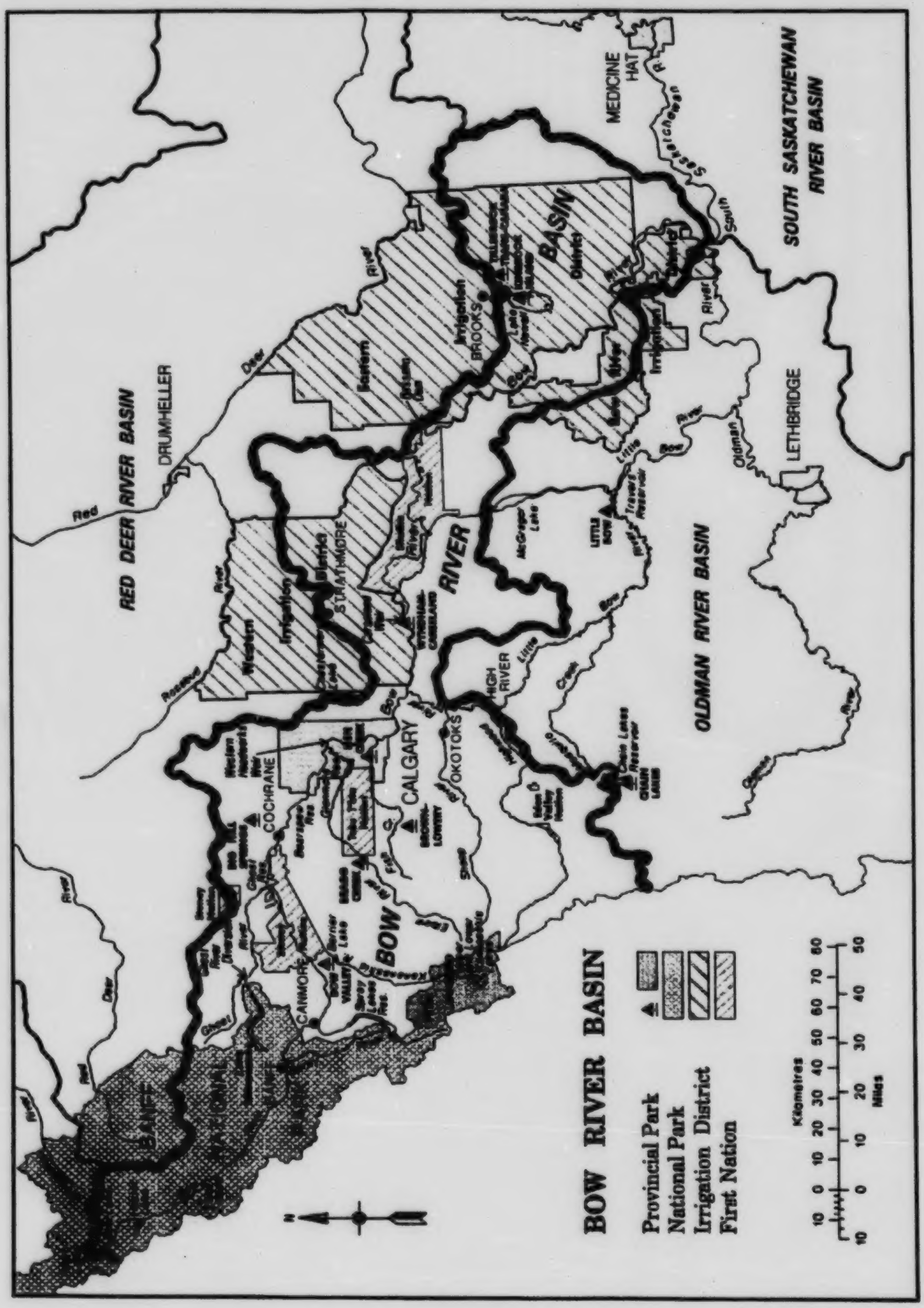
[2] The enhancements in water quantity modeling that are planned include: improvements to irrigation demand and return flow modeling, incorporation of instream objectives as they are established, extension of the climatic and historical stream flow data base, and the ability to represent operational strategies that vary from year-to-year. There is a significant need to provide a clear understanding of the model, improve processing of large amounts of data, and provide effective presentation of results.

[3] Instream needs are the flow and water quality required to satisfy instream uses of water and to protect the river ecology and riparian environments.

Map G.1 Bow River Basin


RED DEER RIVER BASIN
DRUMHELLER
Red
Deer
River
Rosebud
MEDICINE HAT
South Saskatchewan R.
SOUTH SASKATCHEWAN RIVER BASIN
LETHBRIDGE
Oldman
OLDMAN RIVER BASIN
BASIN
BROOKS
Eastern Irrigation District
Lake Newell
Bow River Irrigation District
Western Irrigation District
STRATHMORE
Chestermere Lake
BOW RIVER
Little Bow
McGregor Lake
Travers Reservoir
Chain Lakes Reservoir
HIGH RIVER
OKOTOKS
CALGARY
COCHRANE
CANMORE
Ghost
Elbow
Sheep
Highwood
Kananaskis
BANFF
NATIONAL
PARK
BOW RIVER BASIN
Provincial Park
National Park
Irrigation District
First Nation
Kilometres
10 0 10 20 30 40 50 60 70 80
Miles
10 0 10 20 30 40 50
N

The development of instream objectives[4] will allow water users to work out mutually acceptable targets for management and protection of the river and its ecosystem. Regulators will be confident that the instream objectives are effective and implementable since the objectives will be based on a consensus of water users developed through an open process using sound scientific information.

The enhancement of computer models for water quantity analysis will improve the ability to assess implications of decisions. Continuing efforts to improve water quantity modeling and make it more user-friendly will benefit all stakeholders since they will gain greater understanding of and trust in the results of analysis.

Water quality analysis is a key aspect of the plan. Downstream of Calgary, computer modeling is probably needed to understand impacts on water quality.

### *Who Could Be Affected*

The success of the plan depends on providing ways that people can express their views, learn more about issues, and contribute to finding better ways of managing water. There are several ways people can become involved in and informed about the plan, including:

- involvement in the Bow River Basin Council
- working groups on issues like instream objectives
- newsletters
- open houses, information sessions, and other meetings
- information packages
- phone calls, discussion groups
- submissions (e.g., letter, briefs).

As of July 2001, the following activities have contributed to the plan:

- Public meetings (November 1995 - January 1996) on issues and plan design. (Lead: Bow River Basin Council)

- Ongoing water quality monitoring to support the plan. (Lead: Alberta Environment [AENV])

- Development of instream needs for fisheries in the Bow River from Ghost Dam to Bassano Dam. (Alberta Sustainable Resource Development [ASRD])

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[4] Instream objectives are targets for flow and water quality that are derived through compromises and trade-offs among instream needs, withdrawals uses, and effluent discharge requirements.

- Development of instream needs for fisheries in the Kananaskis River. (Lead: ASRD)

- Development of instream needs for fisheries in the upper Elbow River (downstream of Glenmore Reservoir). (Lead: AENV)

- Development of instream needs for fisheries in the lower Elbow River downstream of Glenmore Reservoir. (Lead: Trout Unlimited Canada and the City of Calgary)

- Inventory of fisheries for the Bow River downstream of Bassano Dam. (Lead: ASRD)

- Initial phases of inventory/data collection on riparian vegetation along the Bow River downstream of the City of Calgary. (Lead: AENV)

- Development of instream needs for recreation for the Kananaskis River. (Lead: Alberta Community Development)

- Development of instream needs for recreation for the Bow River from Ghost Dam to Bearspaw Reservoir (Lead: Kasey Clipperton, Master's Degree Project, University of Calgary)

- Development of instream needs for water quality for the upper Elbow River upstream of Glenmore Reservoir. (Lead: Upper Elbow Instream Objectives Working Group)

- Determination of instream objectives for the upper Elbow River (Lead: Upper Elbow River Instream Objectives Working Group)

- *Report of the Upper Elbow Instream Objectives Working Group*

- Public meetings on instream objectives for the upper Elbow River (Lead: Bow River Basin Council)
- Acceptance of instream objectives for the upper Elbow River (Lead: AENV)

- Preliminary assessment of ground water conditions. (Lead: Ground Water Working Group)

- Refinement of computer modeling of TransAlta's hydro system. (Lead: TransAlta Utilities)

- Scoping of requirements for water quality analysis/modeling for the Bow River downstream of Calgary. (Lead: AENV)

- *Guidebook to Water Management* (Lead: AENV and Guidebook Working Group)

- Forecasts of population growth and economic development. (Lead: AENV)

- Highwood Management Plan, Phase 1. (Lead: AENV)

- Non-Irrigation Consumptive Demand Projections: Little Bow Project EIA (Lead: AENV)

- Revision of instream needs for the Highwood River (Lead: Alberta Transportation)

- Scoping of non-storage options: Highwood Management Plan (Lead: AENV)

During the period from August 2001 to October 2002, the following results are expected:

- Recommended instream objectives for the Kananaskis River
- Recommended instream objectives for the lower Elbow River
- Strategy for implementing instream objectives for the upper Elbow River
- Draft instream objectives for the Bow River from Bearspaw Dam to Bassano Dam
- Revised instream needs for the Highwood Management Plan
- Revised diversion plan for the Highwood River

For further information, contact:

Bob Morrison, Project Manager
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-6462
Fax: (403) 297-6069
E-mail: Robert.S.Morrison@gov.ab.ca

## G.9 Bow River Irrigation District Water Management

### *Background History*

With the exception of 15,000 irrigable acres on the Carseland-Bow Headworks, the bulk of the acres on the Bow River Irrigation District's assessment role are downstream of Little Bow Reservoir. Water is supplied to the District through the headgates on the Little Bow outlet structure.

The District's works consist of a large, high-capacity main canal running through the centre of the irrigated area. Branching off this canal is a series of canals and pipelines called laterals and sub-laterals. A system of drainage canals runs through the irrigated area for the purpose of taking away unused water.

There are three storage reservoirs within the District: one near the end of the large main canal and the other two near the end of two large laterals.

There is a water re-use facility at Lost Lake that pumps irrigation spill back into the main canal for re-use.

### Administration

The irrigable area downstream of Little Bow Reservoir is divided into twelve irrigation blocks. Each of the blocks is operated by a separate Water District Supervisor (ditchrider). Within these blocks is a series of lateral, sub-lateral, and drainage canals. The water for these systems is supplied by the large main canal.

In the spring when there is sufficient demand, the main canal is charged and, if necessary, water is placed in the storage reservoirs to meet target elevations.

Ditchriders receive water orders and shut-off notices from the water users in their respective blocks. This information is passed on to the District Water Controller on a daily basis. The Water Controller ensures there is enough water in the main canal to satisfy demand and meet target elevations in the three storage reservoirs.

### *Return Flow*

A consequence of delivering water in the District is return flow. Delivered water that is for one reason or another not being used or water that spills off of irrigated land could end up in a return flow channel. Out of the 195,000 acres of irrigation land downstream of Little Bow Reservoir, approximately 10% drains to the Oldman River, 40% drains to the Bow River, 25% drains to Lost Lake, and the remaining 25% drains into reservoirs (either Scope, Badger, or Dam H).

Return flow is managed by getting timely and accurate communication of demands from water users. This allows adjustment of the Little Bow headgates to closely match canal supply with users' demand.

For further information, contact:

Bow River Irrigation District
Box 140
807 – 7 Avenue North
Vauxhall, AB
T0K 2K0
Tel: (403) 654-2111
Fax: (403) 654-4197

## G.10 Bow River Project

The Bow River Project is a non-profit, multi-agency public service body that promotes the conservation, enhancement and wise management of riparian areas through control of invasive plant species and educational initiatives.

Partners include government representatives (federal, provincial, municipal), First Nations, corporations, and other non-government organizations.

Project activities take place throughout the Bow Basin's riparian areas, including those along the Bow's tributaries.

Riparian areas border rivers and streams, and protecting them can enhance water quantity and quality, as well as provide crucial wildlife habitat and recreational opportunities.

Riverfront housing development is proceeding at a fast pace in the Bow River Basin. To help ensure that this development takes place in an environmentally sustainable manner, the Bow River Project and partners are developing guidelines for home/land owners and planners/developers to help them to make sound land management decisions.

Through management of all the resources in the Bow River Basin, the natural diversity of the aquatic and riparian ecosystems can be conserved.

For further information, contact:

George Stalker
Bow River Project Coordinator
Agriculture Centre
Bag Service #1
Airdrie, AB
T4B 2C1
Tel: (403) 948-8540
Fax: (403) 948-2069

## G.11 Calgary Health Region's Role in the Management of Water Quality

This is an outline of the regulatory processes administered by the Calgary Health Region that are related to water quality issues. It introduces the role of the Calgary Health Region in water-related concerns respecting land development and provides a general overview of the legislation noted below. This legislation is a key to the regulatory framework of the Calgary Health Region. An important part of the mandate of Alberta Health and, particularly, the regional health authorities is to administer the *Public Health Act* (SA 1984, as amended to 2001, c. P-27.1) and the regulations.

### *Basic Principles*

The *Public Health Act* prevails over any enactment with which it conflicts, except the *Alberta Bill of Rights* (Section 83), and provides for the enforcement of the Act and regulations, e.g., fines for contravention, orders, and notices of health hazard.

The authority of the regional health authorities is derived from the *Public Health Act* and its regulations. The Act is directed towards protecting the health of the public and is very broad in application. Regional health authorities interpret the general text of the legislation while suitably respecting the mandates of other government agencies.

### *Administration*

The *Public Health Act* establishes a number of health authorities, including the:

- Public Health Appeal Board:
  - Hears appeals to the administration of the *Public Health Act* and regulations.
  - May vary some decisions made by the regional health authorities.

- Regional health authorities:
  - Appointed in various areas of the province, in accordance with the *Public Health Act,* to administer the *Public Health Act* and regulations within their designated jurisdiction
  - Under the *Public Health Act*, investigate and take appropriate action on any complaints and referrals that they receive with respect to nuisances and general sanitation. The Act gives specific direction in some very limited areas of environmental management. Otherwise, the Act empowers the regional health authorities to interpret the legislation and take whatever action they

deem necessary. The legislation and any enforcement actions by executive officers of the regional health authorities is generally subject to waiver by or appeal to the regional authority or appeal to the Public Health Appeal Board.

- Executive officers of regional health authorities:
  - Appointed by the regional health authorities to enforce the *Public Health Act* and regulations

The *Public Health Act* allows the Lieutenant Governor-in-Council to make regulations in these areas:

- Nuisances:
  - Section 75(f): "respecting the prevention and removal of nuisances." A nuisance is defined in the Act as "any condition that is or that might become injurious or dangerous to the public health, or that might hinder in any manner the prevention or suppression of disease."
- Drinking water:
  - Section 75(f)(1)(v): "respecting the location, operation, maintenance, equipping, cleansing, disinfecting and disinfestation of…(v) wells, water fountains, cisterns and water tanks."
- Waste management facilities and outdoor lavatories:
  - Section 75(g): "respecting the construction, location, operation, maintenance, disinfection, disinfestation and disposition of waste management facilities and outdoor lavatories."
- Contaminants: Section 75(g)(1): "prescribing the maximum level of contaminants permissible in air or water."

The regulations under the Act that may impact land development and water issues are:

- *Communicable Disease Regulation*: Generally empowers the authority to take appropriate action to deal with any communicable diseases (including water-related diseases).
- *Housing Regulation*: Empowers the authority to take appropriate action to deal with complaints and referrals on public health issues (including water-related issues).

- *Nuisance and General Sanitation Regulation*: Empowers the authority to take appropriate action to deal with complaints and referrals on public health issues (including water-related issues). Specific sections in the regulations are:
  - Section 2(1): "No person shall create, commit or maintain a nuisance."
  - Section 2(2)(c): "Without limiting the generality of subsection (1), no person shall create, commit or maintain [something] that is or might become injurious or dangerous to the public health or that might hinder in any manner the prevention or suppression of disease."
  - Section 2(3): "An executive officer who receives a complaint alleging the existence of a nuisance in the health unit in which he is designated an executive officer shall visit the place or premises complained of and inquire into the facts."
  - Section 14: "Where a person provides a source of water that he intends to be used or realizes or ought to realize will be used by the public for human consumption, he shall ensure that the water is potable."

- *Recreation Area Regulation*: Empowers the authority to take appropriate action to deal with specific issues respecting recreation areas (including water-related issues).

For further information, contact:

Environmental Health Program
Calgary Health Region
P.O. Box 4016, Station C
320 – 17 Avenue SW
Calgary, AB
T2T 5T1
Tel: (403) 228-7570
Fax: (403) 228-8698

## G.12 Canada-Alberta Flood Damage Reduction Program (FDRP)

### *Background and History*

After a flood, the governments of Alberta and Canada are frequently asked to compensate property owners for damage caused by the flood. Governments are also asked to find a solution to the flooding problem. Until recently, the traditional solution to flooding problems has been to build structures such as dams, dykes and channel modifications to divert flood water away from homes, farms and businesses. These structural measures are expensive to construct and maintain. Since they do not provide complete protection from flooding, they also create a false sense of security and may even attract additional investment to flood-prone areas. This increases the potential for loss of life and property damage.

In recent years, there has been a shift in government emphasis from expensive structural solutions to less expensive and more environmentally sustainable non-structural solutions such as land use planning, zoning, floodproofing, and flood preparedness.

### Basic Principles

The FDRP is an example of a non-structural approach to flood damage and reduction. The program identifies urban areas subject to flood damage and will reduce future flood damage by encouraging non-structural solutions such as land use planning, zoning, floodproofing and flood preparedness.

### Administration

In April 1989, the governments of Canada and Alberta signed *An Agreement Respecting Flood Damage Reduction and Flood Risk Mapping in Alberta.* Under this agreement, the two governments will prepare flood risk maps for floodprone communities in the province.

Once a flood risk map has been prepared for an area, the map is reviewed with the municipal government and the public. The municipal government is also asked for its agreement with the designation of the floodplain (called the "flood risk area") and to incorporate the floodplain into bylaws governing development. Designation is made by the federal and provincial ministers responsible for the FDRP.

Following designation of the floodplain, the federal, provincial, and municipal governments will encourage adequate floodproofing of new development in the fringe of the floodplain. It is contemplated under the FDRP that, once a floodplain had been designated, there will be planning for management of the floodplain. There are no agreements in place between governments for this post-designation planning.

The FDRP agreement between the federal and provincial governments expired in March 1999. The provincial government continues to do work under the program as resources allow.

### Influence on Water Management

The FDRP will reduce the financial toll and risk to people's safety due to flooding. This will be accomplished by making the public and municipal governments aware of which land is most prone to flooding and by discouraging inappropriate development in the floodplain.

The FDRP will also reduce the cost of water management. These cost savings will be achieved by, first, limiting flood disaster payments and second, reducing the need for costly and, usually, not cost-effective structural solutions to flooding problems. The key to realizing these cost-savings is implementing local land use controls.

### Who Could Be Affected

A flood risk map shows the 1-in-100 year floodplain of a particular river. The 1-in-100 year floodplain is the land that has a 1% chance of being flooded in any year.

Where local conditions permit, the map will show two zones of flood hazard: the floodway and the flood fringe. The floodway is the area of greatest risk. It is the area that is closest to the river and, during a flood, has the deepest, fastest, and most destructive flow of water. Development in the floodway should not increase obstruction of the flow so that the floodway capacity is affected. In the flood fringe, floodwaters are shallow (<1m in depth) and move slowly (velocity<1m/sec). The flood risk map in some cases may also show an ice hazard zone, which is the area subject to damage from ice movement.

Upon designation of the 1-in-100 year floodplain, the federal and provincial governments will implement certain policies. For a one-zone floodplain:

- No new federal or provincial government buildings or structures that are vulnerable to flood damage will be placed in the floodplain.
- Financial assistance from the federal and provincial governments will no longer be available for new buildings or structures placed in the floodplain and subject to flood damage.
- Any buildings or structures vulnerable to flood damage placed in the floodplain after designation will not be eligible for flood disaster assistance except under exceptional circumstances.
- The federal and provincial governments will encourage local municipalities to adopt land use restrictions to prohibit further development in the floodplain.

For a two-zone floodplain:

- The above policies will apply to the floodway only.
- New development in the flood fringe must be adequately protected from flooding ("floodproofed") or, unless there are exceptional circumstances, it will not be eligible for flood disaster assistance. New development includes major additions or enlargements to existing buildings. Normal maintenance and repair is not considered to be new development.

Development in the floodplain that exists at the time of designation will continue to be eligible for flood disaster assistance from the federal and provincial governments. This applies to both one-zone and two-zone floodplains.

As of February 2002, this is the status of floodplain mapping in the Bow River Basin:

Municipalities that have accepted designation of their floodplain

- Black Diamond
- Calgary (Bow & Elbow River)
- Canmore
- Cochrane
- Turner Valley
- M.D. of Bighorn
- M.D. of Foothills (Sheep River: Black Diamond-Turner Valley area)
- Okotoks

Completed flood risk maps are under review by the municipality

- Airdrie
- Bragg Creek
- High River
- M.D. of Rocky View

Flood risk mapping in progress

- Calgary (Nose Creek)

For further information about the Canada-Alberta Flood Damage Reduction Program contact:

River Engineering Branch
Water Management Division
Alberta Environment Room
9th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-6280

Environmental Services Branch
Environment Canada
300, Park Plaza
2365 Albert Street
Regina, SK
S4P 4K1
Tel: (306) 780-5759

## G.13 Canadian Heritage Rivers System

### Background and History

The Canadian Heritage Rivers System (CHRS) was developed in response to a growing public desire to preserve the natural heritage, human heritage and recreational values of our rivers for the benefit of Canadians now and in the future. In February 1994, the Government of Alberta joined the CHRS. Alberta's participation is managed under Alberta Community Development's Parks and Protected Areas Program (see section G.22).

### Basic Principles

As identified in the document *The Canadian Heritage Rivers System – Objectives, Principles and Procedures*, the objective of CHRS is to give national recognition to the important rivers of Canada and to ensure their future management such that:

- the natural and human heritage which they represent is conserved and interpreted
- the opportunities they possess for recreation and heritage appreciation are realized by residents and visitors of Canada.

### Administration

These objectives of the CHRS are met through a cooperative effort between the federal, provincial, territorial, and municipal governments. Provincial and municipal jurisdictions retain their traditional powers to manage the river according to their existing legislation and regulations. This is a central guiding principle outlined in the CHRS objectives, principles, and procedures. Parks Canada participates in and encourages the establishment, growth and public awareness of the CHRS. They may also financially assist nominating agencies in the carrying out of studies and the preparation of plans related to the nomination and/or management of rivers proposed for inclusion in the system. Each river to be included within the system will be jointly designated as a "Canadian Heritage River" by the Minister responsible for Parks Canada and the appropriate governments with jurisdiction over the river.

Alberta has developed a system whereby rivers within the province can be nominated for designation. The generic process in Alberta's Canadian Heritage Rivers Program is:

- **Provincial System Study** – Completed in 1995 to identify potential candidate rivers

- **Local Authorities Initiative** – Explore potential nomination with local stakeholders

- **Convene Local Committee** – Alberta Community Development works with local stakeholders
  - Identify stakeholders, identify potential structure, share information, explore interests, form local committee(s), choose a facilitator, identify process and procedures (consistent with the *Guiding Principles for Consensus Processes*)

- **Information Gathering**
  - Background Study – Terms of Reference, hire consultant, identify the values of the river (including the human/natural history and recreational values), identify issues, determine if and why the river is a CHRS candidate
  - Issues and Interests – for each sector identify issues related to the river and identify what is important and why
  - Alberta's CHRS – learn more about the CHRS vision, principles, objectives, and explore its potential to support local interests

- **Approvals of Background Study** – Local Committee including Municipal, First Nations and Provincial Government representatives

- **Nomination Document** – This is basically a summary of the Background Study demonstrating that the river is of outstanding Canadian significance
  - Clarify that no sector's interests are negatively affected by nomination

- **Approvals of Nomination Document** – Local Committee, Municipalities, First Nations, Provincial Cabinet

- **CHRS Board Approval** – This national board will approve the nomination if the river is of national significance and its values meet the CHRS integrity guidelines

- **Management Strategy** – Created by the local committee and consultant
  - Check that those necessary to resolve the issues are represented, create the common vision for the river, complete identification of issues and sectoral interests, design options for mutual gain, draft management strategy.

- **Approval of Management Strategy** – Local Committee, Municipalities, First Nations, Alberta Community Development Minister

- **CHRS Board Review** – Designation is granted upon receipt, they do not approve or reject the content of the strategy

- **Implementation** – Carried out by all authorities and stakeholders in partnerships identified in the specific river's management strategy

- **Monitoring** – performed according to the river's management strategy

### Status of CHRS in the Bow River Basin

The report *Canadian Heritage Rivers Systems Study of Rivers in Alberta* has been prepared. The report shortlists several rivers and segments thereof in the Bow Basin as having priority for CHRS nomination. These are:

| | |
|---|---|
| AA (highest priority): | ▪ Bow River: Calgary to Bassano Dam<br>Highwood River |
| A (second priority): | ▪ Sheep River |
| B (third priority): | ▪ Bow River: Canmore to Morley<br>▪ Bow River: Ghost River Dam to Bearspaw Dam<br>▪ Bow River: Bassano Dam to South Saskatchewan River<br>▪ Elbow River: Above Glenmore Reservoir<br>▪ Elbow River: Below Glenmore Reservoir |

As of April 1999, no proposed nominations are under consideration for these rivers or segments.

Costs for the CHRS are shared as follows:

- Parks Canada assumes the cost of staffing and operating the Secretariat for the CHRS Board.
- Parks Canada assumes the cost of publicizing the CHRS both at national and international levels.
- The CHRS Board provides assistance to managing jurisdictions for the preparation of studies required by providing background studies, nomination documents and management plans. These studies are cost shared on a 50/50 basis.
- The government responsible for managing a designated river assumes the responsibility of implementing the recommendations in the management plan.

- In addition, the Government of Canada could, through other federal-provincial programs, share the costs of studies and developments identified in the management plan of the designated river that are consistent with the objectives of both those existing joint programs and the CHRS if it so chooses.

For further information on CHRS, contact:

Laura Graham
Parks and Protected Areas Division
Alberta Community Development
5th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-2096
Fax: (780) 427-1178

## G.14 City of Calgary's Water Management

### *Basic Principles*

See the City of Calgary Water Management Policies (Section D.3).

### *Administration*

The City of Calgary's responsibility in water management consists of:

- water treatment and distribution
- wastewater treatment and collection, including stormwater
- riverbank stabilization and flood control.

Calgary has two sources for drinking water. The Bow River supplies the Bearspaw Water Treatment Plant, and the Elbow River is the source of water for the Glenmore Water Treatment Plant. The Bearspaw Plant primarily supplies water to the north section of the city while the Glenmore Plant supplies the south. However, the water supply from the two plants is interconnected through large-diameter transmission mains to ensure a reliable supply at all times.

The Sewer Division operates two wastewater treatment plants providing secondary and tertiary treatment with ultraviolet disinfection. Digested sludge is injected into agricultural land as a fertilizer and soil conditioner. The sanitary sewer collection system consists of 3,275 kilometres of mains (1997) and the stormwater drainage system consists of 2,768 kilometres of mains (1997), wet ponds, dry ponds and relief systems.

## *Influence on Water Management*

### *Water Efficiency*

Water efficiency is a crucial component of long-term water demand management. Two priorities have been identified:

- The City of Calgary has a water meter incentive program that promotes water conservation through the installation of meters in new housing development. The success of the program and supporting water efficiency activities has resulted in the percentage of metered customers increasing from 22% in 1991 to 56% in 2000.
- Waterworks will be preparing a *Water Efficiency Master Plan* to develop a strategy for water efficiency incentives and policies that will be implemented over the next 15 to 20 years. The plan will focus on the efficient management of water resources to reduce overall water consumption and delay the timing for facility upgrades.

### *Wastewater Treatment*

Calgary's first wastewater treatment plant, Bonnybrook, was constructed in 1932; its purpose being the protection of public health. Some of these structures are still in place and functioning as part of the treatment process. Since 1932 the plant has undergone numerous expansions with the focus now including protection of the environment.

Following expansion in 1994, the Bonnybrook plant has an average design capacity of 500,000 $m^3$/day and uses the most recent technology in biological nutrient removal and ultraviolet disinfection.

The smaller, but also advanced in design, Fish Creek Plant has an average design capacity of 72,000 $m^3$/day and provides tertiary treatment for phosphorous removal and ultraviolet disinfection.

In 1994 and again in 1999, the City of Calgary Sewer Division (now Wastewater and Drainage) received national recognition for the quality and level of wastewater treatment. In both years, Calgary received the highest ranking in the Sierra Legal Defence Fund's "National Sewage Report Card."

Regulation of discharge into the sanitary collection system is controlled through the *Sewer Service Bylaw*. The intent of the bylaw is to control sewage strength and protect against the discharge of prohibited materials.

The application of municipal sludge (now called 'biosolids' to reflect the biological origin of the material) to farmland is a program adopted by the City in 1975 and is regulated by the provincial government and adheres to the provincial *Guidelines for the Application of Municipal Sludges*. The Guidelines pertain to rates of application as they relate to nutrients and metals. One application of biosolids often provides sufficient fertilizer value for two or more crop years. Tests are conducted to check nutrients that have been depleted before a re-application is undertaken. Care is also taken to ensure metals do not build up to a point where they would pose a danger to health. Calgary is fortunate to have very low metal levels in its biosolids due to limited heavy industry and stringent source control programs.

The standards for water quality treatment by wastewater treatment plants are controlled through the *Environmental Protection and Enhancement Act* (Section E.3.2) and by regulations under that Act.

### *Stormwater Management*

Stormwater management has evolved from simple collection and conveyance to that of a complete management system involving long range planning, water quality monitoring, construction, operation and maintenance, and systems design. It now includes impoundments (wet ponds, wetlands and dry ponds), relief trunks, and to a lesser extent, the use of ditches, swales, and channels. Water quality improvement practices include sediment and erosion control, wet ponds, constructed wetlands, and oil-grit separators. Due to water quality requirements, dry ponds are being used less; the majority of ponds being constructed now are wet ponds and wetlands. Please refer to the document *Stormwater Management and Design Manual (2000)* available on the Internet at: www.gov.calgary.ab.ca/wwd/OnLineManuals.html

These systems provide flood control, protection of water supply, and bank protection of small receiving streams.

Long-range planning establishes the framework for the direction and criteria of stormwater management. It defines the drainage area of stormwater catchment boundaries and provides release rates of the major trunks. This provides the criteria for establishing the planning detail of dry ponds, wet ponds and other relief systems. These relate to discharge rates to specific receiving bodies (e.g., Nose Creek), dry ponds for flood control, wet ponds and constructed wetlands for protection of potable water supply (water quality), flood control, and control of quantity and quality of stormwater entering the Western Headworks canal.

A moratorium has been placed on the discharge of stormwater into the Western Headworks canal. The moratorium is an informal agreement and not included in specific legislation or order-in-council. However, the conditions for accepting stormwater drainage into the canal have always been clearly stated by Alberta Environment and understood by the City of Calgary. The moratorium conditions are:

- The developed City of Calgary storm sewer drainage boundaries are fixed as of April 1980, with no new storm sewer outfalls to be allowed.
- Alberta Environment will not allow any increase in volume or discharge rate over those existing in 1980.
- The City of Calgary is to examine ways of reducing or eliminating existing storm inflows to the canal.

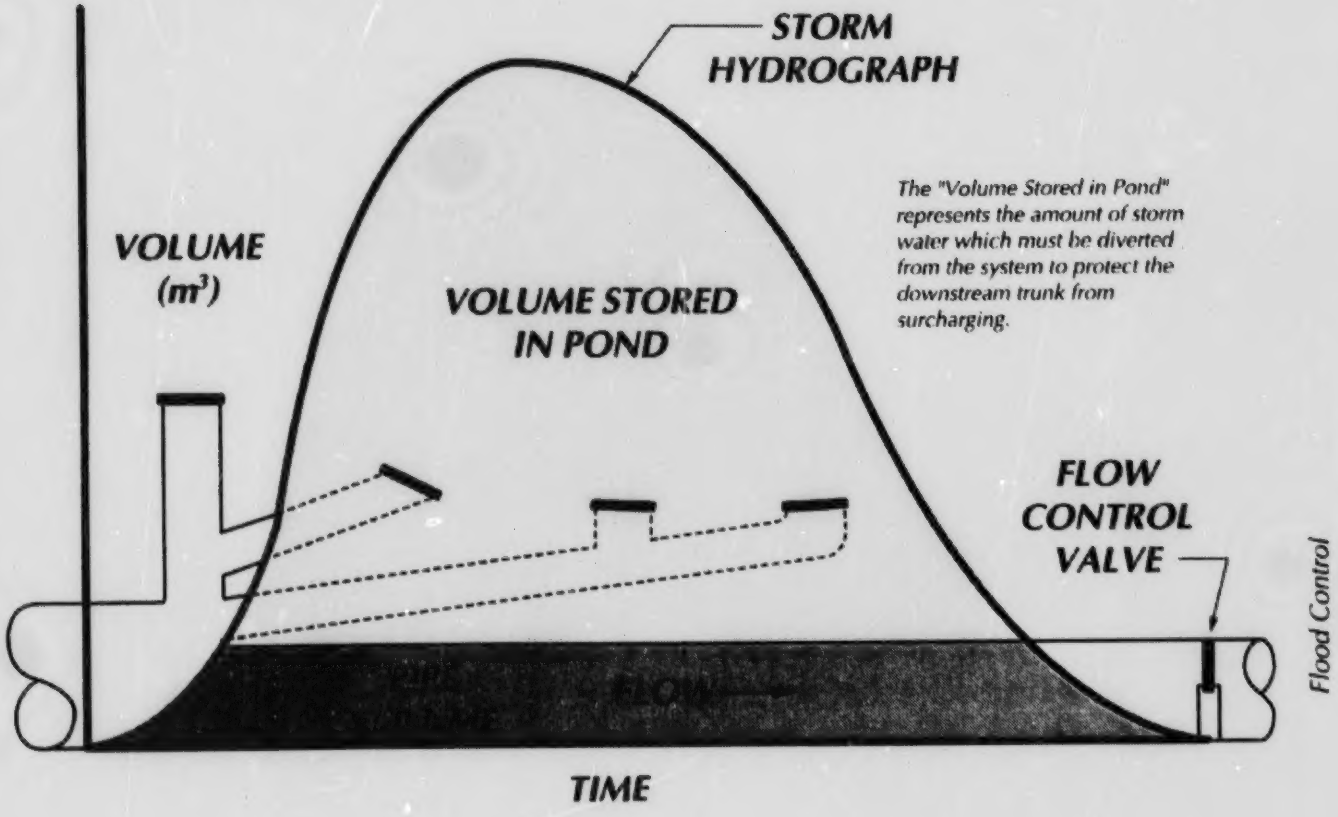
In June 1997, the City and Alberta Environment proceeded with the Western Headworks Canal Diversion Study. The study was completed in October 1997. The study recommended a diversion channel alignment on the east side of the Transportation and Utility Corridor. The diversion channel would be sized to handle excess stormwater flows in the canal as well as stormwater from approximately 45% of the existing developments and all future developments in the upstream catchment areas of the canal. The diverted stormwater would be detained within a relatively small area by diking the southwest corner of the Shepard Slough Complex. The Shepard Ditch will be upgraded in stages to handle the outflows from the Shepard Slough as well as receive stormwater discharges from future developments south of Shepard Slough.

The stormwater drainage system has two components: collection and storage.

Dry ponds are relief systems that provide a diversion of excess flows from a storm sewer trunk to an impoundment for temporary storage. As the flow in the diversion chamber declines, the dry ponds empty back into the system. Their purpose is flood control (see Figure G.1). However, they can be adapted to provide some water quality protection.

Wet ponds and wetlands are typically located at the end of storm sewer trunks. However, due to flood control and water quality requirements, they are commonly being found throughout the development areas. Wet ponds and wetlands remain full and provide sufficient retention time for water quality improvement prior to discharge to a receiving stream or other water body.

Figure G.1 Storm Hydrograph


STORM
HYDROGRAPH
VOLUME
(m³)
VOLUME STORED
IN POND
FLOW
CONTROL
VALVE
FLOW
TIME
Flood Control

*The "Volume Stored in Pond" represents the amount of storm water which must be diverted from the system to protect the downstream trunk from surcharging.*

Constructed wetlands are shallow wet ponds with planted vegetation. Wetland vegetation provides additional nutrient removal capabilities.

Relief stormwater trunks provide additional capacity to storm sewers during high intensity storm events. Their purpose is flood protection.

To accommodate high intensity rainfall, wet ponds, dry ponds and wetlands have been incorporated into the design of new subdivisions. In older areas, where flooding problems have occurred, dry ponds (and wet ponds/wetlands where possible) are being constructed where temporary storage is available or by retrofitting relief trunks into the collector system.

In the past, the majority of ponds constructed have been dry ponds. They have been constructed on municipal reserve, municipal school reserve, public utility lots, or within green belts in residential areas. The primary purpose of dry ponds is water quantity control, although some water quality improvement may occur.

Where the proposed pond has been a retrofit to an existing collection system, input from various groups (e.g., school boards, community associations, the City Parks & Recreation Department, special interest groups, and other possible stakeholders) is solicited. For facilities in new areas, input occurs from the Site Planning Team, which includes representatives from school boards, community associations, and the City Departments of Parks & Recreation and Planning & Building.

The water management policies of the City of Calgary are critical to the maintenance of a healthy ecosystem in the Bow River.

The City of Calgary has in place a practice of stormwater outfall inspection on the Bow River, Elbow River and Nose Creek. Weirs have been installed in the outfalls to collect floatables (oil, grease, gasoline, etc.). These collection basins are pumped on a scheduled basis.

City policies directly impacting on water management in the Bow River are outlined below:

> Nose Creek: Guidelines for stormwater discharge into Nose and West Nose Creek were adopted in 1986. Development is restricted at or above the 1:100 year flood level and discharge rates are limited to 2.6 L/sec/gross ha of development. Ponds in these areas are constructed to provide storage volume for the 1:100 year flood and the permitted discharge rate.

Bow River: Stormwater cannot be discharged directly to the Bow River above the Bearspaw Reservoir. Previously, stormwater ponds had to intercept the flow and be capable of providing a 24-hour retention in a 1:10 year rainfall event. Newer ponds must provide water quality whereby a minimum removal of 80% of TSS (Total Suspended Solids) and a 24-hour detention period is achieved.

Elbow River: The curtailment of new stormwater outfalls discharging directly to the Glenmore Reservoir and upstream of the reservoir was adopted by City Council in 1986. To protect drinking water, a project has been completed to intercept stormwater flow and spills on the Glenmore Trail causeway and discharge the water downstream of the reservoir. Ponds are constructed to provide water quality protection.

Fish Creek: The establishment of Fish Creek Provincial Park brought about the curtailment of new stormwater outfalls in the park. However, the province has since relaxed the restriction and adopted a policy of acceptance subject to rigorous environmental controls and site-specific necessity.

A water quality assessment program is being conducted to establish "Total Loading" of treated sewage effluent, stormwater drainage, and surface water runoff to the Bow River. The assessment is to be completed by 2003. Through monitoring and modeling, the assessment will establish a benchmark for four parameters (TSS, TP, Ammonia Nitrogen, and CBOD) entering the Bow River that affect its water quality and in turn the total ecosystem.

### *Riverbank Stabilization*

Riverbank stabilization is carried out on an "as required" basis and is cost shared, with the Province paying 65% of the cost. Private lands are not included in this policy.

### *Flood Control*

The City of Calgary has accepted designation of the 1-in-100 year floodplain of the Bow and Elbow Rivers within the City.

Development that existed at the time of designation will continue to be eligible for flood disaster assistance from the federal and provincial governments.

New development in the floodway – the area most vulnerable to flood damage – will not be eligible for flood damage assistance. New development in the remainder of the floodplain (the "flood fringe") must be adequately protected from flooding ("floodproofed") or it will not be eligible for flood disaster assistance. New development includes additions or enlargements to existing buildings. Normal maintenance and repair is not considered to be new development.

### *Permitting Abilities*

*Guidelines for Erosion & Sediment Control* is a policy directed at land development. One of the objectives is to control stormwater loading to the receiving bodies. The purpose of these guidelines is to provide developers and consulting engineers with a practical method of ensuring that urban construction is carried out in a manner that will keep soil erosion to a minimum level. Specific requirements relating to this fall under the "permit" requirements for development of land.

See also *Stormwater Management and Design Manual (2000)* for policies. Regulations and design criteria for stormwater management are available on the Internet at: www.gov.calgary.ab.ca/wwd/OnLineManuals.html

### *Enforcement Procedures*

The City of Calgary controls wastewater discharge into the collection system through the *Sewer Service Bylaw*. Industries with high-strength sewage are encouraged to provide pre-treatment before discharging to the sanitary sewer. Throughout the city, many industries, such as food processors, have elaborate pre-treatment systems. Others may require a system as simple as a double sump. The incentive to install pre-treatment relates to the surcharges imposed on above-normal strength sewage and is calculated on a user-pay basis: "the more you load, the more you pay." The City's industrial testing program monitors discharges to the sanitary sewer system so that, where necessary, surcharges can be imposed and other aspects of the bylaw (e.g., prohibited materials) are adhered to. Bylaw enforcement officers can issue tickets for infractions of the *Sewer Service Bylaw*. The maximum fine is $10,000. The minimum fine is $300.

For further information, contact:

**Wastewater treatment:**

Plant Engineer
Wastewater Treatment Plants
City of Calgary Tel: (403) 268-3855

**Waterworks:**

Production Engineer
Water Treatment Plants
City of Calgary Tel: (403) 287-5111

## G.15 Cooperative Management: Memorandums of Understanding

Several First Nations have been seeking greater involvement in renewable resources and environmental matters on lands adjacent to their reserves. As a result of several Supreme Court decisions, provincial governments have a legal obligation to consult with aboriginal peoples when undertaking activities that may affect their treaty rights. Cooperative Management Memorandums of Understanding (MOUs) provide an effective consultation process to meet this obligation.

Since the fall of 1994, MOUs have provided an effective framework for ongoing, meaningful consultations. These agreements help build effective working relationships between First Nations, the Alberta Government and third parties such as industry, while recognizing and respecting existing rights. Currently, there are two MOUs in place and both are viewed as pilot projects. Consideration of new MOUs will not occur until an evaluation is completed on the existing ones.

Cooperative management in this context is defined as the process of consultation and cooperation on renewable resources and environmental matters of mutual interest. This is different from "co-management," which implies joint management and joint decision making.
While joint management and joint decision-making powers are not granted under an MOU, several substantive benefits are gained. MOUs do the following:

- provide a vehicle for meaningful consultation by working cooperatively with First Nations and aboriginal communities to achieve resource or environmental management objectives and to improve relations
- provide a framework for First Nations or aboriginal communities to have opportunities to benefit economically and socially from resource development
- facilitate development activity on a stable, long-term basis with the consultation of key stakeholders
- assist First Nations or aboriginal communities in working towards long-term, meaningful, sustainable employment.

For further information, contact:

Andy Masiuk, Senior Advisor/Negotiator
Aboriginal Affairs, Policy Secretariat
Alberta Environment & Alberta Sustainable Resource Development
11th Floor, South Petroleum Plaza
9915 – 108 Street
Edmonton, AB
T5K 2G8
Tel: (780) 422-9498
Fax: (780) 422-5136
E-mail: Andy.Masiuk@gov.ab.ca

## G.16 Crowfoot Creek Watershed Water Quality Study

The Crowfoot Creek Watershed Water Quality Study was conducted from 1996 to 2000 to determine whether agricultural practices are contributing to deterioration of surface water quality in the watershed and to identify specific land uses having an adverse impact. The watershed is a tributary of the Bow River located 85 km east of Calgary in Wheatland County, an area with a high rate of population growth, a high degree of agricultural intensity, a growing oil and gas industry, and increased irrigation utilization.

Initial stakeholder meetings were held in 1996 to acquire community support to proceed with the study. A monitoring program was implemented and results were reported to stakeholders at annual meetings and through a newsletter, "Up the Creek with a Paddle." Water quality was monitored at 28 sites. Results indicated levels of total phosphorus exceeded water quality guidelines most of the time, but were highest during spring runoff and rainfall events. Levels of total nitrogen exceeded guidelines mainly during spring runoff and rainfall events. Fecal coliform bacteria counts exceeded irrigation guidelines much of the year and appeared to be related to the presence of cattle in the watershed. Guidelines for total dissolved solids were exceeded from spring runoff through early summer and during some rainfall events. Manganese and iron concentrations exceeded some guidelines during spring runoff. Of the 25 pesticides monitored, dicamba, 2, 4-D and MCPA appeared consistently and exceeded irrigation guidelines during part of the monitoring period.

In response to open discussions regarding the study results, the Crowfoot Creek Watershed Group (CCWG) was formed in January 1999 to develop a proactive action plan for the watershed. Community leaders are pioneering a unique partnership approach to managing water and land resources. The group is working with community producers and residents towards the adoption of practices, so that water leaving the basin will be equal to or better than water coming into it. The group is comprised of local agricultural producers and residents and is based out of the Wheatland County office east of Strathmore. Partners include Wheatland County, Village of Standard, Ducks Unlimited, Health Authority 5, PanCanadian Petroleum, Pheasants Forever, Prairie Farm Rehabilitation Administration, Town of Strathmore, Western Irrigation District, Alberta Agriculture, Food & Rural Development, Husky Oil, Elite Swine/Pinnacle Swine/Landmark Feeds, Bow River Basin Council, Rosebud River Watershed Partners, and Agriculture & Agri-Food Canada. The group is also supported though the community riparian program and the Alberta Environmentally Sustainable Agriculture Program.

The partnership approach taken by the community is proving to be effective in its effort to promote a sustainable environment and economy. CCWG initiatives include a consultative survey to identify the concerns and practices of landowners in the area. Beneficial management practice demonstration sites are also being established to increase awareness of what can be done to help maintain a healthy water supply. The CCWG was also selected as a finalist for the Emerald Awards in 2000.

For more information, contact:

Phil Boehme
Watershed Coordinator
Crowfoot Creek Watershed Group
Hwy 1, RR1
Strathmore, AB
T1P 1J6
Tel: (403) 934-3321
E-mail: ccwg@telusplanet.net

or

Gerald Ontkean
Irrigation Branch
Agricultural Centre
100, 5401 – 1 Avenue South
Lethbridge, AB
T1J 4V6
Tel: (403) 381-5891
E-mail: gerald.ontkean@gov.ab.ca

## G.17 Eastern Irrigation District Water Management

### *Background and History*

The Eastern Irrigation District (EID) is the successor to the Canadian Pacific Railway Co. Ltd. (CPR) for its irrigation project in the Brooks, Alberta region. The project began in the early 1900s as a means of promoting settlement in the area and attracting revenue from land sales and shipping of goods. The project was turned over to the region's farmers in 1935 under the *Eastern Irrigation District Act*. Since that time, the EID has been operated under an elected Board of Directors comprised of irrigators in the region.

### Basic Principles

The EID currently operates under the auspices of the *Irrigation Districts Act* of Alberta. Its primary mandate is to operate, administer and maintain a comprehensive network of canals, reservoirs and drains in support of irrigated agriculture. As of 2000, more than 280,000 acres of land are irrigated annually.

In addition, the EID operates its facilities in a manner that benefits the regional economy, municipalities, industry, recreation, and the environment. The district's administrative region covers an area in excess of 1.5 million acres. The multiple purpose water management practices of the EID support all of the human water consumption needs in the entire region, either through rural water supplies or organized co-ops and municipalities. The district's thirteen internal storage reservoirs are managed for irrigation water supplies, as well as for sport and commercial fisheries and other recreational pursuits. In addition the EID irrigation system provides water for more than 40,000 acres of critical wetland habitat in the region.

In addition to the operation of the irrigation network, the EID owns and operates the largest block of non-Crown privately owned native and improved pasture in Alberta. This landmass is in excess of 600,000 acres. It is managed for cattle production, wildlife, and recreation benefits.

### Administration

The EID is operated by a seven-member elected board made up from the irrigators in the region. Terms are for three years and elections are on a staggered basis. The EID has a professional management structure including administration, engineering and construction, information services, and water delivery operations.

The canal network is in excess of 1,200 miles in length. Water deliveries for primary irrigation are made to more than 1,400 individual clients on more than 4,000 individual parcels of land. In addition, the EID owns, operates, and maintains its own headworks facilities on the Bow River at the Bassano Dam. Water deliveries to irrigators are coordinated by field staff on a daily basis throughout the period of May to October each year.

### Who Could Be Affected

The EID's irrigation network is the only secure water supply for the entire region (more than 1.5 million acres). Ground water is hard to find and of insufficient quality for any practical agricultural or human use. As such, management of the network requires coordinating a number of issues including water supplies for:

- primary agricultural production
- rural domestic residences
- on-farm and range livestock production
- municipalities and industry
- recreation
- wetland and other environmental enhancements.

All development in the region is affected by access to and the quality of the water supply. As such, the EID is involved in many areas of concern outside of primary irrigated agricultural production.

In order to meet its many obligations and commitments to the community, the EID undertakes a number of programs that are geared to enhance water management. These programs include:

#### *Annual Capital Upgrades to the Canal Network*

Under cost-shared programs with the Province of Alberta and with its own capital funding, the EID is engaged in a long-term system improvement program that is designed to improve water handling capabilities, reduce seepage damages to agricultural lands, and promote water conservation.

#### *System Automation and Monitoring*

The EID has established a number of sites where strategic parts of the irrigation network can be remotely monitored and controlled. This provides the opportunity for a more timely response to changes in water demands within the system. In addition, the EID has established more than 20 remote monitoring sites to gauge water returning to the Bow and Red Deer River systems. This information is used to help determine an annual water balance and water audit in the region. The audit assists in determining future areas of emphasis where water management practices can be enhanced.

### Wildlife Management

While the EID has no direct mandate in regards to wildlife issues, it maintains a staff position to coordinate how district operations can be made more beneficial to wildlife operations. The EID has been engaged in cooperative wildlife projects with Ducks Unlimited for more than 50 years and cooperates annually on new initiatives. In addition, the EID has begun collecting annual wildlife statistics on species in the region and making this information available to external agencies.

### Economic Evaluations

The EID prepares frequent reviews of the economic values directly and indirectly associated with its water management operations. The results of these assessments in 1994 and 1995 indicate that the water supplies available in the region translate into more than $1 billion dollars of economic input annually.

### Publications and Information

The EID maintains a number of means to communicate its activities to irrigators and the public. It holds Town Hall styled meetings each spring in various areas of the district with its irrigators. It publishes a newsletter, *The Waterline,* up to four times a year. This newsletter is circulated to irrigators, municipal, provincial and federal government departments and officials, and others interested in water management. The EID is also an Internet service provider through its EIDNet operations. The EIDNet is an additional means of providing more up-to-date information on activities taking place within the EID. The EIDNet home page is located at: http://www.eid.ab.ca/

### Water Quality Testing

The EID has been involved in water quality initiatives within the district and the Bow River Basin since 1993. Water quality testing is performed at its diversion works on the Bow River on a regular basis during the diversion season. In addition, other site-specific testing is performed within the district and the return flow channels to the Bow and Red Deer Rivers.

### Participation in External Organizations

The EID also assists long-term water management initiatives by actively participating in a number of external organizations at the local, provincial and national level. The EID is a member of the Brooks and District Environmental Committee, the Bow River Basin Council, the Alberta

The IRPs were prepared with the participation of resource managers and included consultation with municipalities, interest groups, industry, and the public. Each IRP provides direction to provincial government agencies on how to discharge their mandate over land and other resources in concert with other agencies.

The provincial government's policy for the South Saskatchewan River Basin is contained in the *Water Management Policy for the South Saskatchewan River Basin* (see section D.2.5). This policy resulted in guidelines limiting irrigation expansion and provided for the establishment of instream needs and water conservation objectives and guidelines.

The *Water Management Policy for the South Saskatchewan River Basin* and water planning studies in the Bow River Basin were prepared with the participation of resource managers and included consultation with municipalities, water users, interest groups, industry, and the public. The *Water Management Policy* and the results of water planning studies provide guidance to provincial government agencies.

Integrated management of land, water, and other resources continues to be a cornerstone of current water management planning for the Bow Basin and the South Saskatchewan River Basin.

### Administration

An IRP is implemented by each provincial agency through regulatory approvals or discharge of other responsibilities. Implementation of each IRP includes monitoring, reporting, reviewing, and amending processes. An approved IRP carries the authority of the provincial government and is approved by either the provincial Cabinet or, after consulting with other ministers affected by the IRP, the Minister of Environment.

The *Water Management Policy for the South Saskatchewan River Basin* and the results of water planning studies are implemented in three ways:

- day-to-day activities of resource management agencies
- operational planning conducted by Alberta Environment
- integrated water management plans (such as the Bow Basin Plan) where there are multi-disciplinary, multi-resource issues, major strategic issues, or planning pursuant to that legislation.

The government is developing proposals to improve and streamline integrated resource management decision making across the government.

Alberta Environment
Information Centre
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## G.19 Integrated Resource Management

### *Background and History*

The need to manage provincial land and other resources in an integrated fashion evolved from various studies and the work of federal and provincial agencies focusing on the management of land and resources in the Eastern Slopes of the Rocky Mountains. These initiatives led to the development of the *Eastern Slopes Policy* (Section D.2.4) in 1977, which in turn led to the adoption of an integrated resource planning program for the province.

During the mid-1970s, the provincial government also began to integrate other resources such as fish, wildlife, and land into its water planning. The first efforts at integrated water planning were in the Red Deer and Oldman River Basins. These planning studies led to the South Saskatchewan River Basin Planning Program in 1980.

### *Basic Principles*

Integrated Resource Management (IRM) is an interdisciplinary and comprehensive approach to managing Alberta's natural resources. IRM integrates decisions, legislation, policies, programs, and activities across resource sectors to gain the best overall long-term benefits for society and to minimize conflicts. The principles of IRM require that the decision maker consult appropriately and fully consider others' interests.

The provincial government's policy for the Eastern Slopes (covering the Rocky Mountains, Foothills, and part of the Parkland eco-region) is contained in *A Policy for Resource Management of the Eastern Slopes, Revised 1984*.

This policy has guided resource management decisions and the development of a series of sub-regional and local Integrated Resource Plans (IRP).

The IRPs were prepared with the participation of resource managers and included consultation with municipalities, interest groups, industry, and the public. Each IRP provides direction to provincial government agencies on how to discharge their mandate over land and other resources in concert with other agencies.

The provincial government's policy for the South Saskatchewan River Basin is contained in the *Water Management Policy for the South Saskatchewan River Basin* (see section D.2.5). This policy resulted in guidelines limiting irrigation expansion and provided for the establishment of instream needs and water conservation objectives and guidelines.

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Integrated management of land, water, and other resources continues to be a cornerstone of current water management planning for the Bow Basin and the South Saskatchewan River Basin.

### Administration

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- day-to-day activities of resource management agencies
- operational planning conducted by Alberta Environment
- integrated water management plans (such as the Bow Basin Plan) where there are multi-disciplinary, multi-resource issues, major strategic issues, or planning pursuant to that legislation.

The government is developing proposals to improve and streamline integrated resource management decision making across the government.

### Influence on Water Management

Integrated resource management is a key ingredient in the provincial government's efforts to ensure sustainable development.

Past integrated management initiatives in the Bow River Basin are listed below, along with summaries of key water-related objectives, guidelines and recommendations. The documents should be consulted for specific wording and for other water-related objectives, guidelines and recommendations.

For further information contact your local office of Alberta Environment:

| | |
|---|---|
| Southern Region, Calgary | Tel: (403) 297-5959 |
| Prairie Region, Lethbridge | Tel: (403) 381-5430 |

Bow Corridor Local IRP Status: Approved by Cabinet committee (April 1992). Being implemented.

Examples of Water-Related Objectives:

- Maintain streamflows and protect basic water quality and instream uses to sustain the Bow River and tributaries for future generations.
- Maintain and enhance fisheries habitat.
- Ensure that management of water resources continues to reflect operating guidelines and administrative practices under the *Water Act*, the *Water Management Policy for the South Saskatchewan River Basin*, and other legislation of environmental significance.
- Prevent vegetation changes that could cause extreme fluctuations in streamflow resulting in erosion of channel materials, high sediment loads, property damage or water supply problems.
- Prevent or minimize soil erosion associated with land use activities.

Examples of Water-Related Guidelines:

- Manage river system on a multiple-use basis for benefit of all Albertans and downstream users.
- Establish preferred and minimum instream needs for reaches of major streams.
- Evaluate water use and changes in quality to determine impacts on fisheries and tourism and need for mitigation.
- Review applications pertaining to water bodies to provide direction and operating conditions, such as timing constraints, to prevent negative impacts on fisheries and habitat.
- Monitor jet boat activity to determine potential for environmental impacts and conflicts with users.
- Protect watercourses and springs from siltation and pollution by enforcing setback/development conditions.

| | |
|---|---|
| Eastern Irrigation District Integrated Resource Management Strategy | Status: Approved by Sustainable Development Coordinating Council (August 1995) and Eastern Irrigation District Board of Directors (October 1995). Being implemented. |

Examples of Water-Related Objectives:

- Manage irrigation network to meet irrigation and associated domestic needs as authorized within EID licence.
- Maximize beneficial and wise use of water.
- Manage operation of irrigation network to promote multiple-use benefits.
- Manage irrigation network to prevent pollution and reduce potential for adverse effects on humans/environment.
- Increase quality and quantity of habitat for fish production
- Permit recreational activities adjacent to or on water bodies.
- Manage wetlands on EID-owned land to meet multiple-use objectives.
- Manage wetlands projects to improve the water quality of conveyance flow.
- Increase managed wetlands from 22,500 acres to 45,000 acres.
- Initiate range management practices that conserve water.

Examples of Water-Related Guidelines:

- Manage irrigation network consistent with EID licences and policies.
- Manage EID-controlled water bodies first for irrigation and domestic purposes. Consider needs of fish in management of water. Wherever possible and feasible, manage water bodies for recreational activities.
- Maximize beneficial and wise use of water through definitions of "conservation" and "efficiency," improved water-handling capabilities, and on-farm water application practices.
- Encourage concurrent uses of water, e.g., manage and time canal flows to meet non-irrigation requirements such as recreation, wildlife habitat, and small hydroelectric facilities.
- Continue or implement initiatives such as use of water quality objectives and guidelines, EID's membership on the Bow River Basin Council, and monitoring of water quality by provincial governments and EID.
- Manage riparian poplars in accordance with *Conservation and Management Strategy for Riparian Forests in Southern Alberta*.
- Identify requirement of fish species.

Eden Valley Local IRP Status: Ministerially approved (March 1991). Being implemented.

Examples of Water-Related Objectives:
- Maintain water quality in streams and rivers.
- Maintain water yield to satisfy on-site and downstream demands for domestic, agricultural, and industrial uses, and fish and wildlife populations. Sub-objective: maintain adequate flows in the Highwood River and Sullivan, Trap, and Pekisko Creeks to support rainbow trout spawning from the Bow River.
- Maintain and enhance naturally reproducing gamefish populations.

Examples of Water-Related Objectives:
- Continue to monitor water yields and quality in the planning area.
- Protect sport fish populations and habitat by minimizing contact between development and streams, maintaining water quality, and reclaiming disturbed sites.

Ghost River Sub-Regional IRP Status: Approved by Cabinet (June 1988). Being implemented.

Examples of Water-Related Objectives:
- Maintain optimum water yield of streams to satisfy both increasing downstream and on-site demands.
- Maintain optimum instream flows for fish.
- Maintain and/or increase quality and quantity of aquatic habitat conducive to maintaining high water quality and supporting fish populations at optimum densities.
- Prevent vegetation changes that could cause extreme fluctuations in streamflow, resulting in erosion of channel materials, high sediment loads, property damage or water supply problems.
- Maintain and, where possible, improve water quality of streams and lakes.
- Prevent or minimize soil erosion associated with land use activities.

Examples of Water-Related Guidelines:
- Monitor water yield and quality to ensure maintenance of a high-quality water resource.
- Review land use applications and resource development plans to identify impacts on fisheries.
- Include the planning area in a watershed management plan prepared by the Alberta Forest Service.
- Prepare an access management plan.
- Notify provincial agency of situations where land or resource uses may alter water quality, quantity, and flow regime of surface and ground water so that adverse impacts can be assessed and cooperatively minimized.
- Minimize fluctuations in water yield and steamflow by adhering to operating ground rules for timber harvesting and forest protection practices.
- Minimize frequency of stream crossings to lessen sedimentation.
- Address soil erosion through ground rules for developments and internal referral systems of provincial government.
- Encourage recreation developments where recreational use is compatible with environmental conditions.
- Maintain licensed diversions from the Ghost River to Lake Minnewanka for hydroelectric purposes.

Highwood Instream Flow Needs Study — Status: Approved (February 1991). Component of the environmental impact assessment for Little Bow Project. The Natural Resources Conservation Board has requested further planning for management of the Highwood River.

Recommendations:

- Instream flow needs (IFN) for the Highwood River to protect fish habitat and recreation.
- A scenario for diverting water from the Highwood River consistent with the *Water Management Policy for the South Saskatchewan River Basin*, i.e., meets IFN for the Highwood River and supplies sufficient water to the Little Bow Project, subject to the following provisos:
  - Reduce deficits to users on Little Bow River and Mosquito Creek above Little Bow River Reservoir.
  - Develop a water management plan for the Highwood River Basin.

Kananaskis Country Sub-Regional IRP — Status: Approved by Cabinet (March 1986). Being implemented

Examples of Water-Related Objectives:

- Provide water for instream and downstream users.
- Maintain optimum instream flows for fish.
- Provide habitat for fish and wildlife populations.
- Maintain or increase quality and quantity of aquatic habitat including habitat critical to survival of fish populations.
- Provide quality recreational experiences.
- Minimize potential conflicts among recreational uses and conflicts between recreation and resource use activities.
- Minimize erosion and stream sedimentation.
- Maintain forage land base in good condition for protection of watershed values.
- In the Kananaskis/Spray Resource Management Area (RMA), an additional objective is to maintain power generation capabilities on the Kananaskis and Spray Rivers.

Examples of Water-Related Management Priorities:

- Maintain water quality, quantity, and flow regime.
- Maintain abundance, diversity, distribution, and recreational use of fish and wildlife resources.
- In the Kananaskis/Spray RMA, priority is also given to improving water quality, quantity, and flow regime.

Examples of Water-Related Guidelines:

- Restrict vegetation clearing to maintain balance in water yield and streamflow.
- Develop fisheries management plans for drainages with naturally reproducing gamefish populations.
- Intensively manage wildlife and habitat to maximize wildlife production.
- Integrate forest management plans with watershed management.
- Minimize road and trail contacts with streams to lessen sedimentation.

Pekisko-Stimson Water Management Study — Status: Approved (June 1989).
Being implemented by local advisory committees.

Recommendations:

- Assist and advise landowners regarding alternate water supplies for stockwatering.
- Conduct study of Chain Lakes Reservoir operations.
- Determine if water use from Pekisko Creek is acceptable from fisheries standpoint.
- Ensure that all water rights in the basin are protected.

## G.20 Irrigation Rehabilitation Program

This program has been in existence under various names for over 30 years. The major objective, as defined in 1995, is "to optimize returns to the Province from the public's investment in irrigation district infrastructure, while having regard to sustaining the irrigation land base and maintaining a secure water supply for irrigation, domestic, municipal, recreation and wildlife habitat." The Irrigation Rehabilitation Program is a provincial grant program that allocates funding to the irrigation districts on a cost-shared basis. The province contributes 75% and the irrigation district contributes 25%. The provincial contribution is made through the department of Alberta Agriculture, Food and Rural Development. The budget for this program is in the $20 million range. The program is administered by the Irrigation Secretariat.

The irrigation districts submit reports outlining rehabilitation projects proposed for funding under this program to Irrigation Council. Irrigation Council must approve the project prior to the district expending any program funds. Once a project is approved, the department monitors construction and expenditures.

The installation of flow measurement devices capable of providing accurate data on the flows into and out of the irrigation district has been encouraged. The resulting data will assist the irrigation districts to improve operational efficiencies.

Some projects constructed under the program have direct impacts, both positive and negative, on wildlife habitat. Projects to reduce seepage may also reduce wildlife habitat. However, some irrigation district projects create habitat. The irrigation districts often work in conjunction with organizations such as Ducks Unlimited when planning rehabilitation projects.

For further information, contact:

Len Ring, P. Eng.
Manager, Irrigation Secretariat
Alberta Agriculture, Food and Rural Development
328, 200 – 5 Avenue S
Lethbridge, AB
T1J 4C7 Tel: (403) 381-5176

## G.21 North American Waterfowl Management Plan

Signed in 1986 and updated in 1994, the North American Waterfowl Management Plan (NAWMP) is a conservation partnership between Canada, the United States, Mexico, and thousands of farmers across the continent. NAWMP's goals are to recover waterfowl populations by restoring and managing wetland ecosystems, to conserve biological diversity in the western hemisphere, to integrate wildlife conservation with sustainable economic development, and to promote partnerships of public and private agencies, organizations, and individuals for conservation. NAWMP is implemented by six working partner agencies in Alberta: Alberta Sustainable Resource Development, Alberta Environment, Environment Canada, Ducks Unlimited Canada, Alberta Agriculture, Food and Rural Development, and Nature Conservancy Canada. U.S. federal funding is provided through the *North American Wetlands Conservation Act.*

The NAWMP objective in Alberta is to conserve priority wetland and upland habitat for waterfowl and a variety of species, while promoting sustainable agricultural practices throughout the agricultural areas of the province. Extensive land use changes are brought about by NAWMP partnerships with agricultural organizations, efforts to improve agricultural policies and programs to maintain biodiversity and natural habitat benefits, and extension programs targeted at agricultural producers. Land use conservation agreements with landowners, as well as leases, conservation easements and purchases, are used to protect prime habitat sites. Over 4,400 farmers and ranchers are cooperating partners in NAWMP's Alberta Prairie CARE program. Other cooperating partners include local grazing associations and producer groups, wildlife groups, and youth organizations.

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan 1996)

For further information, contact:

Brett K. Calverley, NAWMP Coordinator
c/o Ducks Unlimited Canada
200, 10720 – 178 Street
Edmonton, AB
T5S 1J3
Tel: (780) 489-2002

## G.22 Parks and Protected Areas Program

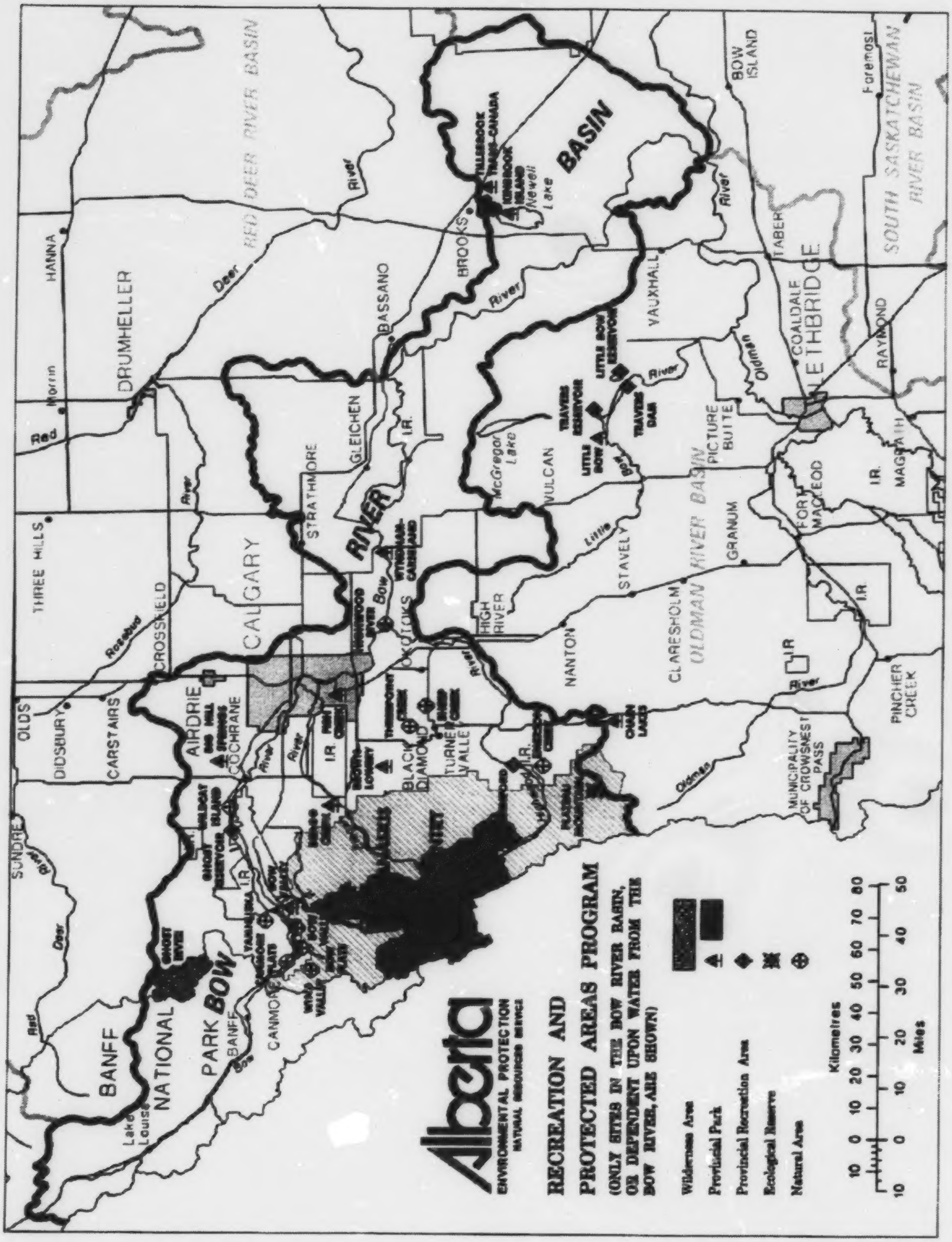
### *Background and History*

The Parks and Protected Areas Program of Alberta Community Development has management responsibilities for several types of land in the Bow River Basin. These are:

- Kananaskis Country (shared responsibility with other government departments)
- Provincial Parks:
  - Big Hill Springs
  - Bow Valley
  - Bragg Creek
  - Brown-Lowery
  - Canmore Nordic Centre
  - Fish Creek
  - Kinbrook Island
  - Peter Lougheed
  - Sheep River
  - Tillebrook Trans-Canada Campsite
  - Wyndham-Carseland
- Wildland Parks:
  - Bow Valley
  - Elbow-Sheep
  - Bluerock
  - Don Getty
- Plateau Mountain Ecological Reserve
- Ghost River Wilderness Area
- Natural Areas:
  - Bow Flats
  - Emerson Creek
  - Highwood River
  - Ole Buck
  - Sheep Creek
  - Three Point Creek
  - Wildcat Island
  - Yamnuska
- Provincial Recreation Areas:
  - Ghost Reservoir
  - Greenford
  - Numerous sites in Kananaskis Country

Map G.2 shows the location of these areas.

**Map G.2 Parks and Protected Areas**


Alberta
ENVIRONMENTAL PROTECTION
NATURAL RESOURCES SERVICE
RECREATION AND PROTECTED AREAS PROGRAM
(ONLY SITES IN THE BOW RIVER BASIN, OR DEPENDENT UPON WATER FROM THE BOW RIVER, ARE SHOWN)
Wilderness Area
Provincial Park
Provincial Recreation Area
Ecological Reserve
Natural Area
Kilometres
Miles
10 0 10 20 30 40 50 60 70 80
10 0 10 20 30 40 50
BOW RIVER BASIN
BANFF NATIONAL PARK
Lake Louise
BANFF
CANMORE
COCHRANE
CALGARY
AIRDRIE
CROSSFIELD
CARSTAIRS
DIDSBURY
OLDS
SUNDRE
THREE HILLS
DRUMHELLER
HANNA
Morrin
STRATHMORE
GLEICHEN
BASSANO
BROOKS
Newell Lake
TILLEBROOK
KINBROOK ISLAND
BLACK DIAMOND
TURNER VALLEY
OKOTOKS
HIGH RIVER
NANTON
STAVELY
CLARESHOLM
VULCAN
McGregor Lake
TRAVERS RESERVOIR
LITTLE BOW RESERVOIR
VAUXHALL
PICTURE BUTTE
COALDALE
LETHBRIDGE
TABER
BOW ISLAND
Foremost
RAYMOND
MAGRATH
FORT MACLEOD
GRANUM
PINCHER CREEK
MUNICIPALITY OF CROWSNEST PASS
CHAIN LAKES
RED DEER RIVER BASIN
OLDMAN RIVER BASIN
SOUTH SASKATCHEWAN RIVER BASIN
GHOST RIVER
WYNDHAM-CARSELAND
I.R.

### Basic Principles

- Kananaskis Country

Most of the land in Kananaskis Country is provincial Crown land managed on a multi-use basis as described in the Kananaskis Country Integrated Resource Plan and Kananaskis Country Recreation Development Policy (May 1999). Kananaskis Country is not a park. It is a multiple use recreation area with a number of protected areas in it. Although activities such as timber harvesting, petroleum development, livestock grazing and hydroelectric power generation are provided for in Kananaskis Country, watershed protection and the development of recreation opportunities remain the Government's priorities.

There are five cornerstones to the Kananaskis Country concept:

- the integration of recreation and traditional forestry land uses
- the provision of a wide variety of quality outdoor recreation opportunities and facilities
- the protection of valuable scenic qualities and ecological features
- the separation of non-compatible uses
- carefully controlled development

- Provincial Parks:
  - include provincially significant natural and historical landscapes and features
  - usually provide a range of facilities and programs to give visitors the opportunity to explore, understand, appreciate and respect the natural environment and contribute to the tourism industry.

- Provincial Recreation Areas:
  - usually small sites that support intensive facilities for outdoor recreation.

- Ecological Reserves:
  - samples of functioning ecosystems protected for scientific research, education, and heritage appreciation and to preserve genetic stocks.

- Wilderness Areas:
  - large areas that retain their primeval character, with minimal management activities.

- Wildland Parks:
  - large areas of natural landscape that cater to eco-tourism and adventure travel
  - interference with natural processes is minimized
  - accommodate hunting, fishing and the use of horses.

- Natural Areas:
  - protect special and sensitive natural landscapes of local and regional significance while providing opportunities for education, nature appreciation and low-intensity recreation
  - facilities typically limited to staging areas, trails and signs.

### Administration

The Parks and Protected Areas Program administers two acts in the Bow River Basin: the *Provincial Parks Act* and the *Wilderness Areas, Ecological Reserves and Natural Areas Act*. Provincial parks and other protected areas are managed by Alberta Community Development. However, ecological reserves and natural areas are managed cooperatively with other provincial agencies, specifically:

- Land and Forest Division, Alberta Sustainable Resource Development

- Public Land Services, Alberta Sustainable Resource Development (the land management agency for natural areas and ecological reserves in the White Area).

Kananaskis country is a unique management situation. Approximately half of the area in Kananaskis Country is Crown land subject to forest reserve policies, with an additional layer of policies guiding recreation use and development. Also located in Kananaskis Country are three provincial parks, an ecological reserve, numerous provincial recreation areas, and two wildland parks.

Two key initiatives administered under the Recreation and Protected Areas Program are Special Places and the Canadian Heritage Rivers System.

Special Places is the Government of Alberta's commitment to complete a network of protected areas to preserve the environmental diversity of the province's six natural regions and twenty sub-regions. The program aims to balance the preservation of Alberta's natural heritage with the program's other three goals of outdoor recreation, heritage appreciation, and tourism/economic development. It is discussed in more detail in Section G.25.

The Canadian Heritage Rivers System (CHRS) was developed in response to a growing public desire to preserve the natural heritage, human heritage, and recreational values of our rivers for the benefit of Canadians now and in the future. CHRS is a federal government initiative. Alberta has developed a system through which rivers within the province can be nominated for designation. CHRS is discussed in more detail in Section G.13.

### *Influence on Water Management*

Sites under the jurisdiction of the Parks and Protected Areas Program, with the exception of provincial recreation areas, are managed to maintain completely or substantially natural landscapes depending on the type of designation. As such, the primary influence of these sites on water management is watershed protection.

The two provincial recreation areas in the basin outside Kananaskis country are small intensively developed sites that provide access to the Highwood River and Ghost Reservoir.

Provincial parks in the basin provide recreation access to the Kananaskis Lakes, the Bow River, the Elbow River and Lake Newell. Little Bow Provincial Park provides recreation access to Travers Reservoir, which receives its water supply primarily from the Bow River Basin.

Recreation facilities in Kananaskis Country provide access to tributaries of the Bow River, particularly the Highwood, Sheep, Elbow, Kananaskis and Spray Rivers, as well as access to hydroelectric storage reservoirs: Spray Lake, Barrier Lake, and Upper and Lower Kananaskis Lakes.

### *Who Could Be Affected*

The watershed protection function of the Parks and Protected Areas Program sites help maintain a natural hydrological regime in the Bow River Basin to the benefit of all water users and the natural environment.

Visitors to sites that provide access to water bodies or recreation sites adjacent to water bodies benefit from the recreation experience. The activities of visitors are managed at Parks and Protected Areas Program sites, at least to the extent that deleterious impacts on water resources are very limited.

Visitors to Parks and Protected Areas Program sites on water bodies have expectations for the quantity and quality of water required to meet their recreation needs and environmental protection interests. These expectations may have an influence on water resource management.

### Authority to Issue Approvals

- Kananaskis Country
  - Outside designated protected areas in Kananaskis Country, the use of Crown land is governed by policy documents such as integrated resource plans.
  - A wide range of recreational and resource industry activities are permitted.

- Provincial Parks
  - Generally, by policy, only limited recreation-related facilities are permitted in provincial parks. However, the Minister of Alberta Community Development has discretion to approve a wide range of dispositions (e.g., industrial, agricultural).

- Provincial Recreation Areas
  - The Minister of Alberta Community Development has discretion to approve a wide range of dispositions.
  - These areas are typically small intensively developed sites, but can also be larger areas where flexibility is required to accommodate resource uses.

- Ecological Reserves
  - Activities are limited to those with beneficial or no negative effects on the ecology of the area.

- Wilderness Areas
  - Very limited management activities.

- Wildland Parks
  - Natural landscapes that can accommodate hunting, fishing and use of horses.
  - Details for this designation are still under consideration.

- Natural Areas
  - The management of these sites is determined by policy and, in some cases, by a site-specific management plan.
  - A wide range of activities can occur but emphasis is almost always on protecting the natural landscape.

### Enforcement Procedures

Enforcement of the *Provincial Parks Act,* the *Wilderness Areas, Ecological Reserves and Natural Areas Act*, and other regulations is carried out by Conservation Officers. Police officers, forest officers, wildlife officers and fishery officers also have the ability to enforce these statutes by virtue of their appointment as peace officers.

For further information, contact:

**Southern Region:**

Parks and Protected Areas Program Headquarters: Canmore
Regional Director: D. Nielsen
Tel: (403) 678-5508

*Sites Within Canmore Area:*

Area manager: R. Andrews, Canmore, (403) 678-5508

- Kananaskis Country
- Provincial Parks
    - Bow Valley
    - Canmore Nordic Centre
    - Peter Lougheed
- Bow Valley Wildland Park
- Natural Areas
    - Bow Flats
    - Yamnuska
- Provincial Recreation Areas – all sites within Kananaskis Country

*Sites Within Calgary Area (in the Bow Basin):*

Area Manager: R. Reilander, Calgary, (403) 297-5293

- Provincial Parks
    - Big Hill Springs
    - Bragg Creek
    - Brown-Lowery
    - Fish Creek
    - Sheep River
- Elbow-Sheep Wildland Park
- Bluerock Wildland Park
- Don Getty Wildland Park
- Plateau Mountain Ecological Reserve
- Ghost River Wilderness Area
- Natural Areas
    - Emerson Creek
    - Highwood River
    - Ole Buck
    - Sheep Creek

  - Three Point Creek
  - Wildcat Island

- Provincial Recreation Areas
  - Ghost Reservoir
  - Greenford

*Sites Within Brooks Area (in the Bow Basin)*:

Area Manager: W. Pedrini, Brooks, at (403) 362-8748

- Provincial Parks
  - Kinbrook Island
  - Tillebrook Trans-Canada Campsite

**Prairie Region:**

Parks and Protected Areas Program Headquarters: Lethbridge
Regional Director: D. Clark

*Sites Within Lethbridge Area (in the Bow Basin)*:

Area Manager: D. Perraton, Lethbridge, at (403) 382-4347

- Wyndham/Carseland Provincial Park

## G.23 Prairie Conservation Action Plan 2001-2005

In June 2001 the Prairie Conservation Forum released the Alberta Prairie Conservation Action Plan (PCAP) 2001-2005. This third generation PCAP provides a blueprint to conserve the biological diversity of prairie and parkland Alberta.

The Alberta PCAP is a conservation strategy inviting landowners, lessees, resource managers, agricultural organizations, interest groups and all Albertans to assist in the implementation of the plan. The plan contains a number of objectives and action recommendations that are linked to four broad goals:

- Acquiring and disseminating information about prairie and parkland ecosystems.
- Ensuring government policies favour the conservation of prairie and parkland ecosystems.
- Adopting land use and resource management practices that sustain diverse ecosystems across the entire landscape.

- Increasing public awareness and promoting education initiatives on prairie and parkland ecosystems.

Over the course of the next five years, the Prairie Conservation Forum will seek to document, quantify, and better understand landscape changes while identifying the implications of impacts on landscape integrity amongst decision-makers and the public.

The updated Alberta PCAP was developed by the Prairie Conservation forum (PCF) – a broadly-based group of approximately 40 member organizations representing agricultural and environmental groups, industry, academia, all three levels of government, and various non-government organizations. Copies are available either on the website at http://www.AlbertaPCF.ab.ca/ or by calling (403) 382-4306.

For further information on the Alberta PCAP, please contact:

Ian W. Dyson, Secretary
Prairie Conservation Forum
2nd Floor, 200 – 5 Avenue South
Lethbridge, AB
T1J 4L1
Tel: (403) 381-5430
Fax: (403) 382-4428
E-mail: Ian.Dyson@gov.ab.ca

## G.24 South Saskatchewan River Basin Water Management Plan

### *Background and History*

Alberta's *Water Act* contains provisions for the preparation of water management plans. The Act includes several requirements and options concerning the topics to be included in a water management plan.

### *Basic Principles*

The purpose of the South Saskatchewan River Basin (SSRB) Water Management Plan is to resolve water management issues such as the availability of water for future allocations and river flows for the aquatic environment. The water management planning process supercedes the "Year 2000 Review." All the original objectives of the Review will be accomplished.

Water management planning in the SSRB is guided by the following documents:

- The *Water Act* (Section E.3.8)
- The *Environmental Protection and Enhancement Act* (Section E.3.2)
- Federal *Fisheries Act* (Section E.2.4)
- *The Framework for Water Management Planning* (refer especially to the Water Management Principles) (Section D.2.3)
- *Water Management Policy for the South Saskatchewan River Basin (1990).* (Section D.2.5)
- *South Saskatchewan River Basin Water Allocation Regulation (1991)*
- *Master Agreement on Apportionment.* (Section F.4.2)
- *1909 Canada-U.S. Boundary Waters Treaty* and the *International Boundary Waters Treaty Act* (Section F.2)
- *Irrigation Districts Act* (Section E.3.4)
- *Alberta's Commitment to Sustainable Development* (D.2.1)
- *A Policy for Resource Management of the Eastern Slopes, Revised 1984* (D.2.4)
- *Fish and Wildlife Policy for Alberta Environment, 1982*
- *A Fish Conservation Strategy for Alberta, 2000-2005* (Section D.2.8)
- The *Public Lands Act* (Section E.3.7)

### Administration

The Plan will be a cooperative and integrated initiative of Alberta Environment, Alberta Sustainable Resource Development, and Alberta Agriculture, Food and Rural Development. The planning process will involve multi-stakeholder basin advisory committees in each of the four main sub-basins and consultations with the public at large.

### Influence on Water Management

The first phase of the Plan will be devoted to the development of a system of water allocation transfers. Licence transfers will permit water allocations to be moved (within the SSRB only) to where the water is most highly valued, subject to conditions. A key goal is to develop the conditions that will be applied. This includes developing the matters or factors that must be considered when reviewing a transfer application. The first phase is to be ready for implementation by April 2002.

The second phase will focus on determining the flow to remain in each river. This will require an assessment of the volumes for human demands and the flows for the aquatic environment. Studies have been either completed or are underway to estimate future human demands for water and river flows required for the aquatic environment. The key goal of the second phase will be to reach compromises between these competing interests and make wise choices. The second phase is scheduled for completion by mid-2003.

The results of the first, second, and subsequent phases will be incorporated into an approved water management plan. Subsequent phases of the plan are yet to be determined.

### *Who Could Be Affected*

The water management plan for the SSRB includes the sub-basins of the Red Deer, Bow, and Oldman Rivers as well as the South Saskatchewan River near Medicine Hat.

Completion of the first phase will allow new development to acquire, subject to government approval, an existing allocation or portion of an allocation (along with its priority). This will influence people to use water more efficiently so that water can be made available for other uses.

Completion of the second phase will result in a better understanding of the availability of water in the SSRB. This will lead to a reduction in the impact of water shortages on people and the aquatic environment.

For further information, contact:

Bob Morrison
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, Alberta Tel: (403) 297-6462
T2E 7L7 Fax: (403) 297-6069

Rob Wolfe
Alberta Environment, Southern Region
301, 2938 – 11 Street NE
Calgary, Alberta Tel: (403) 297-5383
T2E 7L7 Fax: (403) 297-6069

## G.25 Special Places

### *Background and History*

Special Places is the Government of Alberta's commitment to complete a network of protected areas to preserve the environmental diversity of the province's six natural regions and twenty sub-regions. The program aims to balance the preservation of Alberta's natural heritage with the program's other three goals of outdoor recreation, heritage appreciation, and tourism/economic development.

Since the program was announced in March 1995, over fifty sites have been designated, adding over 1.5 million acres to Alberta's protected areas network.

Currently designated provincial parks, wilderness areas, natural areas, ecological reserves, national parks and wilderness parks are existing special places. New special places will be established through the *Provincial Parks Act*, the *Wilderness Areas, Ecological Reserves and Natural Areas* Act,[5] and policy mechanisms.

Recreation areas, forest land use zones, and areas designated by policy support a wide range of intensive recreational pursuits and tourism facilities, often in modified or man-made settings. These areas make minimal contributions to the preservation goal, but are important to the outdoor recreation and tourism goals of Special Places.

### Basic Principles

The primary objective of the program is to complete a network of landscapes that represent the environmental diversity of the province's six natural regions and twenty sub-regions. Special Places balances the preservation of Alberta's natural heritage with three other goals of outdoor recreation, heritage appreciation and tourism.

### Administration

Special Places is administered under Alberta Community Development's Parks and Protected Areas Program (see section G.22). At the local level, volunteer local committees are being asked to examine candidate sites and provide advice on boundary options, site-specific management guidelines, and appropriate land use activities.

Once new sites are established using one of the existing legislative or policy options, a detailed management plan is prepared, giving Albertans a further opportunity to provide input in protecting our shared natural heritage.

For further information on Special Places, contact:

Parks and Protected Areas Division
Alberta Community Development
2nd Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-8441
Internet: http://www.gov.ab.ca/env/parks/sp_places

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[5] It is proposed to replace these acts with the Natural Heritage Act.

## G.26 Surface Water Quality Monitoring and Assessment

### Background and History

The Government of Alberta has been involved in the monitoring and assessment of surface water quality in the Bow River Basin for over 40 years. In the early years, work focused mainly on basic resource inventory studies and on the pollution of the Bow River by poorly controlled industrial and municipal point-source discharges. Following the development of provincial legislation in the early 1970s and the evolution of a regulatory framework to mitigate point-source impacts, water quality studies expanded to include the investigation of non-point sources such as agricultural activity and urban runoff. Recently, the interaction between water quality and quantity has also become an issue of concern in the Bow River.

Provincial monitoring and assessment of surface water quality throughout the Bow River Basin, outside of areas of federal jurisdiction, is currently coordinated by the Water Quality Specialists of Alberta Environment's (AENV), Southern Region, with the actual sampling work carried out by the Monitoring Branch. Surface water quality in Banff National Park is monitored by the federal government (Parks Canada and Environment Canada). Municipalities, irrigation districts, industries, and First Nations also monitor water quality locally. Data collected by these sources are sometimes compiled by AENV for assessment and reporting, providing a comprehensive database for the entire basin.

### Basic Principles

The Water Quality Section of the Air and Water Branch and regional staff deliver a program of lake and river water quality assessments in support of AENV's regulatory, water management, and environmental assessment functions. Chemical, physical, and biological aspects of water quality are monitored. These data are examined for trends (statistically significant changes over time) and are compared to Alberta and Canadian water quality guidelines. This information is interpreted and reported for public use and for use by permitting and enforcement agencies, among others. Monitoring data are also used to produce predictive models, which are used for testing future development scenarios. Real-time water quality monitoring is used to regulate the operation of irrigation diversions during summer and industrial discharges during winter.

To determine the factors influencing water quality and what their effects are, three general types of water quality surveys are carried out. Firstly, long-term monitoring programs at fixed sites are used to evaluate the ongoing effects of provincial regulatory programs, pollution abatement technologies, and the influence of global environmental concerns. In the

Bow River, long-term data have been collected by AENV on a consistent monthly basis since 1978 at Cochrane and Ronalane. Data from the general vicinity of Carseland have been collected periodically since the 1960s and routinely since 1979. More recently, monthly sampling has been done at Exshaw, Cluny and Bow City on the Bow River, and on the Elbow River near the mouth. Long-term data have also been collected since the 1970s by the federal government from the Bow River upstream of Lake Louise and upstream of Canmore.

Short-term surveys are designed to characterize regional water conditions over a finite period of time. For example, synoptic surveys of the Bow River Basin, in which samples are collected in succession downstream and timed according to time-of-travel, have been conducted during summer and winter low flow conditions. These surveys assess the impact of individual point sources (tributaries, irrigation return flows, and effluents) on the Bow mainstem.

Site-specific impact assessments, which are limited both in distance and in time, form the third component of the provincial monitoring and assessment program. Continuous monitoring equipment has been deployed during summer months to assess dissolved oxygen and temperature under warm weather and low flow conditions in river reaches where these water quality conditions may become unsuitable for fish. To date, the most intensive application of this type of real-time monitoring in the Bow Basin has taken place on the lower Highwood River. Another example of an impact assessment study is the documentation of changes in aquatic plant growth downstream of Calgary over 16 years following the implementation of enhanced phosphorous and nitrogen removal at the Bonnybrook and Fish Creek wastewater treatment plants.

### Administration

The Water Quality Section of the Air and Water Branch is responsible for designing and managing water quality surveys and evaluating data. The monitoring and assessment activities undertaken are directed by the needs of various agencies and client groups, both within and outside of AENV (e.g., increased monitoring activity in response to recommendations of the Bow River Basin Council).

### Influence on Water Management

The scientific information compiled through the monitoring and assessment process is fundamental to water management in the Bow River Basin. Advice provided by the water quality professionals within the Airand Water Branch allows water management and regulatory decisions to be made.

### Who Could Be Affected

Water quality information collected from the Bow River Basin is used by a number of client groups within the Alberta Government, including Environmental Sciences Division, Fish and Wildlife Division, and Air and Water, Science and Standards Division regional offices. Other clients include Alberta Transportation (Civil Projects), Alberta Agriculture, Food and Rural Development (Irrigation and Resource Management Division), the federal government, municipal governments, health units, the Prairie Provinces Water Board, the Bow River Basin Council, Ducks Unlimited, consulting firms, and the general public.

For further information, contact:

Al Sosiak, Bow Basin Limnologist
Water Quality Section
Air and Water Branch
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-5921
Fax: (403) 297-6069
E-mail: Al.Sosiak@gov.ab.ca

D. Trew, Head
Water Quality Section
Air and Water Branch
10th Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 427-3029
Fax: (780) 422-6712
E-mail: Dave.Trew@gov.ab.ca

Recent publications on the Bow River available from B. Halbig, at (780) 427-2654, of the Water Sciences Branch include:

Sosiak, A. 1999. *Recent Changes in Contaminant Levels in the Bow River Following the Installation of a Containment System at the Canada Creosote Site.* Alberta Environment, Water Sciences Branch, Calgary. 22 pp.

Sosiak, A. 1996. *Bow River Synoptic Surveys 1994-1995: Preliminary Evaluation of Results.* Prepared for the Bow River Basin Water Council. Alberta Environment, Water Sciences Branch, Calgary. 103 pp.

Saffran, K. A. 1996. *Temporal and Spatial Trends for Coliform Bacterial in the Bow River, 1951-1994.* Alberta Environment, Water Sciences Branch, Edmonton. 52 pp.

Water quality reports are also available for tributaries of the Bow River.

## G.27 TransAlta Utilities Water Management

### *Background and History*

TransAlta Utilities Corporation is the largest electrical power producer in Alberta. The first generating plant in the company's system was a hydro installation at Horseshoe Falls on the Bow River, which began operating in 1911. Today, TransAlta operates three coal-fired generating plants near Lake Wabamun, west of Edmonton, as well as eleven hydro plants in the Bow River Basin and two hydro plants in the North Saskatchewan River Basin.

The generating plants in the Bow Hydro System are located between the headwaters and Calgary, and were constructed between 1911 and 1955. Seven of the plants are located on major tributaries to the Bow: the Spray, Cascade and Kananaskis Rivers. The remaining four plants are located along the mainstem of the Bow River.

There are six large reservoirs in the upper Bow River Basin which are associated with the hydro developments:

1. Lake Minnewanka on the Cascade River
2. Spray Lake on the Spray River
3. Upper Kananaskis Lake on the Kananaskis River
4. Lower Kananaskis Lake on the Kananaskis River
5. Barrier Lake on the Kananaskis River
6. Ghost Reservoir on the Bow River

The operation of the hydro plants and reservoirs upstream from Calgary has a major influence on overall water management in the Bow River Basin.

### *Administration*

*Function of the Hydro System*

TransAlta's combined hydro system (Bow and North Saskatchewan) accounts for 18% of the company's generating capacity. However, there is insufficient runoff to operate the hydro system continuously on a year-round basis. As a result, the hydro system produces approximately 6% of TransAlta's total annual power production (roughly 3% from the Bow and 3% from the North Saskatchewan).

Nonetheless, this relatively small amount of power plays a key role in the Alberta power system. Due to their rapid response times, hydro plants are primarily used for two purposes. The first is to cover peak electrical loads during high demand periods of the day, particularly between 7 a.m. and 10 p.m. The second is to provide load control for the generation system by adjusting to the minute-by-minute changes in power demand.

*Plant Operations*

The individual plants in the Bow River Hydro System have different operating characteristics, which fulfill different purposes.

- The plants off the Bow mainstem are used primarily for peak demand and do not run 24 hours/day. This includes Cascade, Three Sisters, Spray, Rundle, Interlakes, Pocaterra and Barrier. The Spray plant is also used for load control.

- Kananaskis and Horseshoe Plants, on the mainstem of the Bow near Seebe, are run-of-river plants. They have virtually no storage and essentially inflow = outflow. These plants run 24 hours/day.

- Ghost Plant west of Cochrane is used for peak demand. It runs 24 hours/day but there are significant changes in release through the course of a day.

- Bearspaw is used to re-regulate Ghost releases so that flows through Calgary and downstream are relatively constant through the day. The plant runs 24 hours/day.

*Reservoir Operations*

The total storage of TransAlta reservoirs is 25% of the average annual runoff of the Bow River at Calgary (upstream of the Elbow River). Typical operation involves filling the reservoir during the spring and summer, then drawing them down for power production during fall and winter. TransAlta has developed operating curves for doing this. This annual fill and drawdown cycle results in a number of impacts on the river downstream.

- Average flow in the Bow River is reduced from May through July or August.
- Average flow is increased for the rest of the year.
- Winter flow through Calgary is more than double what would have occurred under natural conditions. This improves water supply and dilution/dispersion of effluent.

Water supply for irrigation is augmented in early spring and late summer when natural flow may be insufficient to meet demand.

*Monitoring Activities*

To assist in managing the reservoirs and power plants in the Bow River Hydro System, TransAlta operates a network of nine reservoir level gauges, seven stream flow gauges and six precipitation/temperature gauges in the Bow River Basin.

For further information, contact:

Roger Drury, Supervisor
Hydro Engineering Services
TransAlta Utilities Corporation
409 River Avenue
Cochrane, AB
T4C 2C1
Tel: (403) 932-8492
Fax: (403) 932-8420

## G.28 Water Resource Projects Managed by the Province

### *Background and History*

Alberta Environment (AENV) plays an active role in the management of the water in the Bow River. Operations Support, Southern Region, is responsible for the operation and maintenance of the provincially-owned projects in the Bow River Basin. Alberta Transportation is responsible for the rehabilitation of the provincially-owned water management headworks and implementation of new water management projects at the request of AENV.

In 1943, the governments of Canada and Alberta signed an agreement, whereby Canada agreed to construct certain water management works on condition that Alberta would take over the facilities. In 1950 this agreement allowed the federal government to take over and rehabilitate the Bow River Project from the failing Canada Land & Irrigation Co. in addition to various other projects outside the Bow River Basin.

In 1973, the governments of Canada and Alberta signed another agreement transferring the Bow River Project to Alberta's control. As part of the exchange, Canada agreed to rehabilitate the Western Irrigation District's Bow River Diversion, the Carseland-Bow River Diversion, and the Eastern Irrigation District's Bassano Dam and Brooks Aqueduct.

The province recognized that other headworks systems and district infrastructures were in very poor condition. This, combined with its new ownership of the Carseland-Bow River Headworks[6] and other Headworks, caused Alberta to re-evaluate its water management policy. In 1975, the Ministers of the Environment and Agriculture issued a joint position paper entitled *Water Management for Irrigation Use*. The paper described major policy decisions concerning:

- the management of Alberta's total water resources
- the need for rehabilitation of the irrigation infrastructure
- the contemplated requirements for future expansion.

The role of each department is currently defined as follows:

*Alberta Environment (Water Management)*

- charged with administration of the *Water Act*.
- responsible for the management of Alberta's water resources.
- responsible for the operation and maintenance of all provincially-owned headworks to deliver water to irrigation districts (IDs) and other users.
- major rehabilitation of the headworks systems are funded and implemented by Alberta Transportation at the request of AENV.

*Alberta Agriculture, Food and Rural Development (Irrigation Development)*

- Responsible for administration of the *Irrigation Districts Act*. This Act controls all irrigation WITHIN organized irrigation districts (IDs).
- Provides input to the water licensing process for private irrigation development OUTSIDE of irrigation districts under the *Water Act*.
- Concerned with all aspects of irrigation farming and water distribution systems.
- Responsible for a funding program for the rehabilitation and expansion of irrigation district works (see section G.20)

### Basic Principles

The underlying principle is that existing water conveyance systems must be managed to provide water for multi-purpose uses.

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[6] "Headworks", as used here, are the beginning of a water management project and include the structure for diverting water from the river (e.g., a dam or weir) and facilities for carrying and storing water (usually a canal and reservoir/s).

The province assures a secure and continuous supply of water within the legal limits of the licence issued for each project. In order to achieve continuity of operation and to avoid any duplication with the IDs' operation, agreements are made with IDs and they are paid to operate a portion or all of the headworks systems.

### Administration

The major projects owned and managed by AENV in the Bow River Basin at this time are the Carseland-Bow River Headworks Systems, Western Headworks System, and Little Bow and Women's Coulee Diversions.

AENV provides all operation and maintenance services for the headworks systems. Wherever practical, irrigation units that receive water from the headworks systems became part of the nearest existing irrigation district. For all other uses, control remains with AENV.

### Influence on Water Management

Some information with regard to the major projects managed by AENV is given below. Locations of the projects are shown in Map G.3.

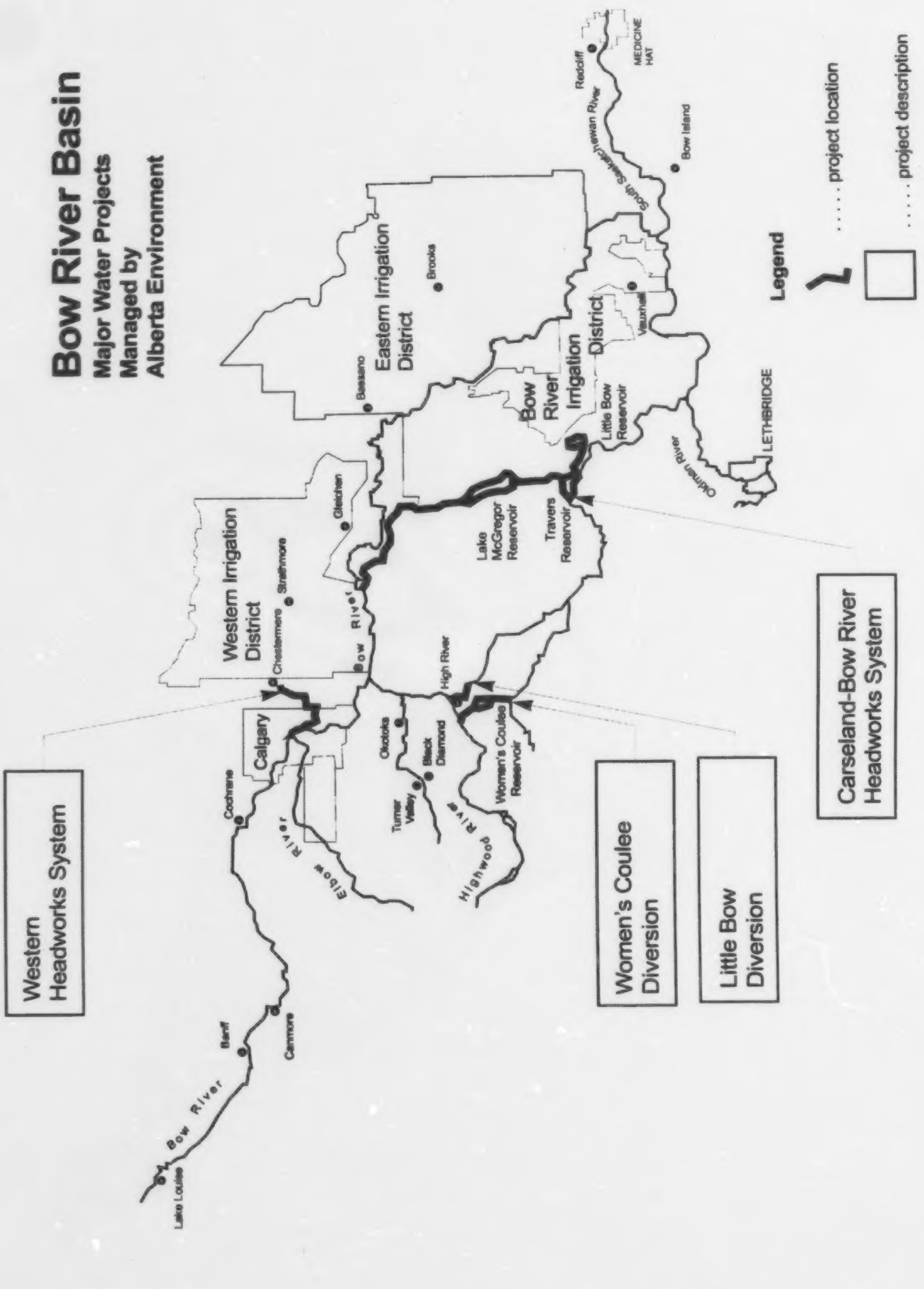
*Western Headworks System*

- Description
  This system includes:
  - Bow River diversion at Calgary
  - Main Canal - Bow River up to (but not including) Chestermere Lake (25 km).

- History
  - The system was built by the Canadian Pacific Railway (CPR) starting in 1903. Water deliveries commenced in 1907. The CPR hoped irrigation would attract more settlers, creating a market for their railway.
  - In 1944, the Western Irrigation District, organized by the irrigators, took over ownership from the CPR. The district has an extensive delivery system with approximately 34,400 ha irrigated in 2000.
  - The headworks system was costly for the district to operate and maintain and was in a deteriorated state when the province took it over in 1977. The headworks were rehabilitated during the late 1980s and early 1990s by AENV.

- Operations
  - The Western Irrigation District operates the river diversion under contract to AENV.
  - AENV provides emergency back-up for operations.

Map G.3 Provincial Water Projects – Bow River Basin


Bow River Basin
Major Water Projects
Managed by
Alberta Environment
Legend
..... project location
..... project description
Western Headworks System
Women's Coulee Diversion
Little Bow Diversion
Carseland-Bow River Headworks System
Western Irrigation District
Eastern Irrigation District
Bow River Irrigation District
Lake McGregor Reservoir
Travers Reservoir
Little Bow Reservoir
Women's Coulee Reservoir
Bow River
Elbow River
Highwood River
Oldman River
South Saskatchewan River
Lake Louise
Banff
Canmore
Cochrane
Calgary
Chestermere
Strathmore
Gleichen
Bassano
Brooks
Vauxhall
Okotoks
Black Diamond
Turner Valley
High River
LETHBRIDGE
Bow Island
Redcliff
MEDICINE HAT

- Maintenance
  - AENV staff located in Calgary and Canmore are responsible for the maintenance of this system.
  - Agreements with the City of Calgary, M.D. of Rocky View, and Town of Chestermere have been signed for "park" type maintenance of bicycle paths, trees, and grass.

*Carseland - Bow River Headworks System*

- Description

  This system includes:
  - Bow River diversion at Carseland
  - Main Canal - Bow River to Lake McGregor Reservoir (66 km)
  - Lake McGregor Reservoir
  - Main Canal - Lake McGregor to Travers Reservoir (3 km)
  - Travers Reservoir
  - Main Canal - Travers to Little Bow Reservoir (2.4 km)
  - Little Bow Reservoir.

- History
  - Development began in 1906 by a British-owned land development company (Southern Alberta Land Co.) to construct a system that would supply water for irrigation in the Vauxhall area.
  - Development of irrigation was not an economically viable venture and continued sporadically until 1950 when the federal government took over control. In a joint effort with the province, the system was rebuilt with a capacity of 41.3 $m^3/s$.
  - In 1974, Alberta took control of the headworks portion of the system. The Bow River Irrigation District was formed and took over the remainder of the system. This system supplies water to 84,986 ha of irrigated land in the Bow River Irrigation District and to 2,023 ha on the Siksika Reserve. It has significant recreational use in the region and supplies water to several municipalities.
  - The first 11 km of the main canal were recently rehabilitated by the Province.

- Operations
  - AENV operates the river diversion and monitors the entire system with management staff headquartered at Calgary and field staff at Arrowwood.
  - The Bow River Irrigation District has been hired by AENV to operate the three reservoirs: McGregor, Travers and Little Bow.
  - The water supply is managed primarily by meeting target reservoir elevations throughout the year at McGregor and Travers Reservoirs by making the appropriate diversions.

- Maintenance
  - AENV staff located in Arrowwood are responsible for maintenance of the system.

*Women's Coulee Diversion*

- Description
  This system includes:
  - Highwood River diversion west of High River
  - Women's Coulee Reservoir
  - Main Canal - Highwood River to Women's Coulee Reservoir (5.5 km) and another 4.6 km of canal downstream of the reservoir to a small creek which leads to Mosquito Creek.

- History
  - This system was built by the Alberta Department of Public Works in 1933 to provide water to users along Mosquito Creek. It was rehabilitated by the Prairie Farm Rehabilitation Administration (PFRA) in 1947. Two years later, PFRA constructed the Women's Coulee Reservoir which has a capacity of 360 $dam^3$. The river diversion, canal and the Women's Coulee Reservoir dam were rehabilitated by AENV in the late 1970s. At the present time, the canal has a design capacity of 1.7 $m^3/s$.

- Operations
  - AENV operates this system with management staff in Calgary and contract staff in High River

- Maintenance
  - AENV employees located in the Southern Region are responsible for maintenance of the system

*Little Bow Diversion*

- Description
  This system includes:
  - Little Bow diversion in the Town of High River
  - Main Canal – Highwood River to Little Bow River (4 km).

- History
  - This system was initially constructed in 1910 along the west boundary of the Town of High River. In 1919, the federal Reclamation Service and the provincial Public Works Department selected the present site of the Little Bow Canal, which was constructed and in service by September 1923. With several minor modifications and realignments since it was first constructed, the Little Bow Canal has a present capacity of about 2.83 $m^3/s$.

- Operations
    - AENV operates this system with management staff in Calgary and contract staff in High River.

- Maintenance
    - AENV staff located in the Southern Region are responsible for maintenance of the system.

*Basin Operations*

As the demand for water in the South Saskatchewan River Basin increases, so does the need to provide overall coordination for basin operations.

It is expected that increasing demand for water will continue due to the following:

- Expansion limits allow a 21% increase in irrigated acreage in the South Saskatchewan River Basin over the 1992 level.

- Alberta Agriculture, Food and Rural Development predict that irrigators will increase the amount of water applied to irrigated crops in order to maximize financial returns.

- Water-based recreation is increasing dramatically, both for instream use (fishing, boating) and for reservoir-based recreation (cottage, boating, fishing). The two are not always compatible.

- Instream needs for water quality, fish habitat and riparian vegetation are being established and water management in the basin considers requirements for this purpose.

All of the foregoing may require dramatic changes in operating plans in order to satisfy the increasing and changing water demands, keeping in mind that AENV must still respect existing licences and meet Alberta's obligations to the other prairie provinces under the *Master Agreement on Apportionment.*

In order for AENV to meet its mandate for water management in the entire South Saskatchewan River Basin, the operations in the Bow River, Red Deer River and Oldman River Basins are becoming more coordinated.

Operations of the provincially-owned projects will play a significant role in allowing the province to meet its many obligations and achieve its policy of managing the water supply for multi-purpose use.

For further information, contact:

Information Centre
Alberta Environment, Southern Region
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## G.29 Watershed Protection

Alberta Environment's management of water is based on a watershed approach. Its many water management programs (e.g., standard setting, monitoring, planning, operations, and issuance of approvals) are designed to ensure that the availability and quality of water does not compromise protection of the aquatic environment or the ability of current and future generations to meet their needs.

Because a variety of initiatives and people are involved in protecting the watershed, there must be close cooperation and consultation. This is achieved through Alberta Environment's Integrated Resource Management (IRM). IRM is an interdisciplinary and comprehensive approach to managing Alberta's natural resources. IRM integrates decisions, legislation, policies, programs, and activities across resource sectors to gain the best overall long-term benefits for society and to minimize conflicts.

Among the many components of Alberta Environment's watershed protection, several are discussed in the *Guidebook*. These include:

- *Water Management Policy for the South Saskatchewan River Basin* (D.2.5)
- *Eastern Slopes Policy* (D.2.4)
- *Wetland Management Interim Policy* (D.2.7)
- *Environmental Protection and Enhancement Act* (E.3.2)
- *Forests Act* (E.3.3)
- *Public Lands Act* (E.3.7)
- *Water Act* (E.3.8)
- *Prairie Conservation Action Plan* (G.23)
- *Master Agreement on Apportionment* and the Prairie Provinces Water Board (F.4.2)
- Alberta Water Management and Erosion Control Program (G.3)
- Approvals for instream activities (G.4)
- Water quality approvals (G.5)
- Water quantity approvals (G.6)

- Bow Basin Plan (G.8)
- Canada-Alberta Flood Damage Reduction Program (G.12)
- Cooperative management with First Nations (G.15)
- Environmental education (G.18)
- Integrated resource management (G.19)
- Parks and Protected Areas Program (G.22)
- Special Places (G.25)
- Surface water quality monitoring and assessment (G.26)
- Management of water resource projects (G.28)
- Contaminated site management (H.1)
- Environmental assessment (H.6)
- Fisheries habitat protection (H.10)
- Forest management (H.12)
- Hazardous waste regulation (H.16)
- Instream needs determination (H.19)
- Land reclamation (H.21)
- Land use guidelines (H.22)
- Regulation of pesticide use (H.24)
- Petroleum storage tank management (H.25)
- Regulation of water and wastewater treatment (H.37)

For general information, contact:

Regional Environmental Coordinator – Southern Region
Alberta Environment
303, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-5647
T2E 7L7 Fax: (403) 297-6069

For specific information, see relevant sections in the *Guidebook*.

## G.30 Yellow Fish Road™

### *Background and History*

Trout Unlimited Canada introduced the Yellow Fish Road™ program in Calgary in May 1991. The Yellow Fish Road™ program's most visible products are yellow markers in the shape of a fish painted on the street near stormwater drains. With the support of the federal Department of Fisheries and Oceans and numerous other partners, hundreds of communities across Canada have approved or implemented this water quality initiative.

### Basic Principles

The Yellow Fish Road™ program is designed to educate the public of the dangers of indiscriminate dumping of unwanted household chemicals such as used motor oil, paint, and solvent down curbside drains. There is a direct linkage from the storm drains to the nearest watercourse. These dangerous practices can harm fish and wildlife, but more importantly affect drinking water sources.

The Yellow Fish Road™ program is a hands-on environmental project that allows young people to help make a difference in water quality in their community and complements the Girl Guides of Canada's national *Water for Tomorrow* program that focuses on water quality and conservation issues.

### Administration

The process for implementing the Yellow Fish Road™ program in your community is:

1. Schedule a presentation at a regular meeting of your local government council.

   Contact a councilor who is involved with environmental projects in the community and who could help schedule the presentation.

2. If the council is interested, then the Yellow Fish Road™ program is presented as an agenda item at a council meeting.

   Usually the presentation is made by representatives of the group that are spearheading the initiative.

3. Council is asked to approve the initiative.

4. Once approval is given, a short-term steering committee is formed to organize a Yellow Fish Road™ campaign that will suit the particular needs of the community.

   Representatives on the steering committee usually include: a youth organization representative, a councilor or representative of the local government administration, and a representative of the public works department. Other individuals interested in introducing the initiative are welcome to be on the committee.

It is imperative to have an individual on the committee who represents the local government. This will help with logistics and contacts with the local media.

5. The steering committee plans the initiative including setting a date, acquiring supplies, contacting the media, and organizing volunteers and local dignitaries.

For further information, contact:

Trout Unlimited Canada, Yellow Fish Road™
Tel: 1-800-909-6040

# H. Best Management Practices

This section provides a list of sources for best management practices in water management and related areas. The topics are organized alphabetically by issue, e.g., "contaminated sites," "erosion control," "land reclamation."

There is no commonly-accepted definition of the term "best management practice." For the *Guidebook*, we have adopted the following definition:

> Best management practices are techniques and procedures that have been proven (through research, testing, and use) to be the most effective and appropriate for use in Alberta. Effectiveness and appropriateness are determined by a combination of the:
>
> - efficiency of resource use
> - availability and evaluation of practical alternatives
> - creation of social, economic, and environmental benefits
> - reduction of social, economic, and environmental negative impacts.

In some cases, there are documents that describe best management practices in a particular field or discipline. In other cases, a document describing best management practices has not been prepared or accepted by practitioners. In those cases, a contact is provided for information on which procedures and techniques are the best.

If you know of techniques, procedures, or contacts that have been missed or additional topics that should be included, please let us know:

Bow River Basin Council
300, Atrium VII 340 Midpark Way SE
Calgary, AB
T2X 1P1

Tel: (403) 254-3419
Fax: (403) 254-3333
E-mail: shamza@earthtech.ca

A useful website for standards and guidelines is:
http://www.gov.ab.ca/env/info/infocentre/index.cfm

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NOTE: The term *water management* includes a variety of activities ranging from water quality monitoring and reducing flood damage to operation of dams and wastewater treatment. plants. However, water management is primarily management of the use of water by people. This involves facilitating and controlling water withdrawal, effluent discharge, and other activities in such a way as to ensure wise use of water and protect it for other users, for future use, and for its inherent value as part of our environment. As a result, *water use management* is often used in the *Guidebook* instead of *water management*.

## H.1 Contaminated Sites

- *What Happens When a Plant Shuts Down*
- *Designation of Contaminated Sites*

These documents describe the process used in decommissioning industrial facilities and designating contaminated sites.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

## H.2 Dam Safety

- *Dam and Canal Safety Guidelines*, March 1999
- *Inspection of Small Dams*, October 1998
- *Guidelines for Involvement in Emergency Response Preparations for Dambreach*, April 1999
- *Dam Owners' Guidelines for the Preparation and Testing of Emergency Plans*, April 1998
- *Dam Safety Guidelines*, Canadian Dam Safety Association, January 1999

  The Canadian Dam Safety Association prepared the *Dam Safety Guidelines* with input from owners, consultants, and regulators across Canada. The *Guidelines* provide consistent requirements and advice for dam safety practice and could provide a basis for nationally consistent dam safety legislation and regulation.

- *Engineering Standards for Water Resources Projects*

For further information, contact:

Dam Safety and Water Projects Branch
Water Management Division
Alberta Environment
8th Floor, 9820 – 106 Street
Edmonton, AB Tel: (780) 422-1356
T5K 2J6 Fax: (780) 427-6334

## H.3 Eco-Labeling

The EcoLogo is a federally-sanctioned label for environmentally responsible products and services that are approved through Environment Canada's Environmental Choice Program. Environment Canada has outsourced the delivery of the program to a private company.

For further information, contact:

TerraChoice Environmental Services Inc.
400 – 2781 Lancaster Road
Ottawa, ON
K1H 7X3
Tel: (613) 247-1900

## H.4 Ecosystem Protection

See specific topics such as enforcement (Section H.5), environmental assessment (Section H.6), erosion control (Section H.8), fish habitat protection (Section H.10), hazardous waste (Section H.16), instream construction (Section H.18), instream needs determination (Section H.19), land reclamation (Section H.21), land use guidelines (Section H.22), pesticides (Section H.24), and riparian land and shoreline use (Section H.27).

## H.5 Enforcement

- Enforcement Program for the *Environmental Protection and Enhancement Act*
- Alberta Environment Administrative Penalty Fact Sheet
- *Release Reporting Guideline*, 1995
- Alberta Environment Compliance Inspection Program Fact Sheet

Alberta Environment's enforcement program is designed to deal firmly with those who do not fulfill their responsibilities to the environment. These documents will assist you in understanding environmental enforcement.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

## H.6 Environmental Assessment

- *Environmental Assessment Process*

  This document describes the rules and procedures used in assessing the environmental impacts of proposed development.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

## H.7 Environmental Education

A wide variety of educational material is available on virtually all environmental topics.

For further information, contact:

Alberta Environment
Public Education and Outreach Branch
9915 – 108 Street
Edmonton, AB Tel: (780) 427-6310
T5K 2G8 Fax: (780) 422-4086

## H.8 Erosion Control

For information, contact:

Alberta Environment, Southern Region
2nd Floor, 3115 – 12 Street NE Tel: (403) 297-6582
Calgary, AB Fax: (403) 297-2749
T2E 7J2 E-mail: Waterman.Account@gov.ab.ca

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*

T. 4

This document is primarily intended for municipalities, subdivision approving authorities, developers, and consultants. Individual landowners may also find it informative. Use of these guidelines will help reduce the potential for damage due to flooding, bank instability, and channel shifting.

- *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks*

  This document is primarily intended for municipalities, subdivision approving authorities, developers, and consultants. Individual landowners may also find it informative. Use of these guidelines will help reduce the potential for the most common problems related to slope instability.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2
Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Erosion Control Reference Manual* (Alberta Transportation and Utilities, June 1998)
- *Fish Habitat Manual: Guidelines and Procedures for Watercourse Crossings in Alberta* (Alberta Infrastructure, 1999)

For copies of these documents, contact:

Alberta Transportation
Tender Administration Clerk
3rd Floor, Twin Atria Building
4999 – 98 Avenue
Edmonton, AB
T6B 2X3
Tel: (780) 415-1068
Fax: (780) 422-0232

## H.9 Feedlots

- *2000 Code of Practice for Responsible Livestock Development and Manure Management* AGDEX 400/27--2

The purpose of the code is to provide guidelines for the siting of new and expanding intensive livestock operations with the intent of:

- providing responsible manure management guidelines
- protecting ground water, surface water, and soil resources
- minimizing the nuisance effects of intensive livestock operations
- providing livestock operators with guidelines to minimize environmental and social impacts
- providing livestock operators and municipal officials with a reference for conflict resolution
- providing municipal agencies with guidelines for land use bylaws and policies
- providing public confidence.

You can obtain a copy of the code from your district office of Alberta Agriculture, Food and Rural Development (AAFRD), or from AAFRD Intensive Livestock Engineers at:

Agriculture Centre
5401 – 1 Avenue South
Lethbridge, AB
T1J 4V6

Tel: (403) 381-5131
Fax: (403) 381-5806

## H.10 Fish Habitat Protection

- *Fisheries Habitat Protection Guidelines*

These are a series of guidelines for geophysical operations, wellsites, pipeline construction, vehicular access across watercourses, timber harvesting, and feedlots. They include protection and reclamation of riparian habitat and minimum setbacks for some activities.

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996)

For further information, contact:

Alberta Sustainable Resource Development
2nd Floor, 9920 – 108 Street
Edmonton, AB Tel: (780) 427-7581
T5K 2M4 Fax: (780) 422-9559

- *Guide to the Code of Practice for Watercourse Crossings, Including Guidelines for Complying with the Code of Practice* (May 2000)
- *Guide to the Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body, Including Guidelines for Complying with the Code of Practice* (April 2000).

Information on the Codes of Practice can be obtained through Alberta Environment regional offices.

- *Fish Habitat Manual: Guidelines and Procedures for Watercourse Crossings in Alberta* (Alberta Infrastructure, 1999).

For a copy of this document, contact your local Alberta Transportation office.

- *Freshwater Intake End-of-Pipe Fish Guideline* (Department of Fisheries and Oceans, 1995)
- *Guidelines for the Use of Explosives in or near Canadian Fisheries Waters* (Department of Fisheries and Oceans, 1998)

These documents are available through the Department of Fisheries and Oceans.

## H.11 Flood Damage Reduction

For information, contact:

River Engineering Branch, Water Management Division
Alberta Environment
9th Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6 Tel: (780) 427-6280

Environmental Services Branch
Environment Canada
300, 2365 Albert Street
Regina, SK
S4P 4K1 Tel: (306) 780-5759

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*

  This document is primarily intended for municipalities, subdivision approving authorities, developers, and consultants. Individual landowners may also find it informative. Use of these guidelines will help reduce the potential for damage due to flooding, bank instability, and channel shifting.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of this document, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## H.12 Forest Management

- *Stream Crossing Guidelines: Operational Guidelines for Industry*
- *Resource Road Planning Guidelines*
- *Table of Road Construction Standards and Guidelines*
- *Predisturbance Watershed Assessment Manual*
- *Provincial Geophysical Guidelines*
- *The Resource Handbook: Operational Guidelines for Industry* (Note: this document is currently being updated and is intended to provide a set of objectives, standards, and guidelines for all types of industrial activities in the Green Area.)
- *Culvert Sizing for Stream Crossings: A Handbook of Three Common Methods*

These are guidelines commonly used in setting operating conditions where access or occupancy has been approved to explore or develop resources on Crown land in the Green Area (i.e., non-settled forest lands).

In timber harvesting operations, detailed ground rules (*The Alberta Timber Harvest Planning and Operating Ground Rules*, 1994) describe how timber harvesting is to be carried out (note: the 1994 *Ground Rules* are currently being revised). In addition to the ground rules, companies may be required to follow guidelines contained in the above manuals. For example, water source areas are identified using procedures described in the *Predisturbance Watershed Assessment Manual*.

Where access or occupancy has been approved to explore or develop oil and gas resources, the company must follow specific operating conditions. These operating conditions specify how operations such as stream crossings, road construction, debris disposal, and reclamation are to be carried out to protect the watershed.

For further information, contact:

Land and Forest Division
Alberta Sustainable Resource Development
10th Floor Petroleum Plaza South Tower
9915 – 108 Street
Edmonton, AB
T5K 2G8
Tel: (780) 427-3932
Fax: (780) 422-6068

## H.13 Golf Course Construction / Operation

- *An Annotated Bibliography and Literature Review on the Potential Impacts of Golf Courses on Freshwater Environments*, by Trutta Environmental and Management for Trout Unlimited Canada. 1992

This literature review and annotated bibliography was prepared to provide a starting point for anyone wanting to learn about the potential impacts of golf course construction and maintenance on aquatic environments and the various recommendations to minimize or avoid the potential impacts. Existing information in the published and "grey" literature was compiled and summarized to provide a background on the identified, potential impacts of golf courses on aquatic environments. The annotated bibliography section provides readers with a summary of each reference. This document is available for $24.00 plus $4.00 shipping and handling.

For further information, contact:

Trout Unlimited Canada
PO Box 6270, Station D
Calgary, AB
T2P 2C8

- *Environmental Position Statements*, Alberta Golf Superintendents Association (AGSA)

  This is a series of ten fact sheets on the environmental aspects of golf course maintenance. Topics include pesticide use, pesticide storage, and fuel storage systems. Each sheet provides the position statement of the AGSA, an outline of the issues, techniques for promoting sound environmental practices, and a discussion of regulatory requirements. The fact sheets are available for $10.00 + GST.

For further information, contact:

Alberta Golf Superintendents Association
104, 4116 – 64 Avenue SE
Calgary, AB Tel: (403) 720-3475
T2C 2B3 Fax: (403) 236-2915

- *Environmental Principles for Golf Courses in the United States*

  These principles were developed by a group of six golf organizations and ten environmental organizations including the U.S. Environmental Protection Agency. The objective of the document is to produce environmental excellence in golf course planning, siting, design, construction, maintenance, and facility operations.

For further information, contact:

Golf Course Superintendents Association of America
1421 Research Park Drive
Lawrence, KS 66049
USA Tel: (913) 832-4435

- *Environmental Stewardship on the Golf Course,* Audubon International. 1996

  This book offers practical conservation management strategies for golf courses and suggests ways to integrate these strategies into on-going maintenance activities. The book was developed with the help of superintendents from across North America.

For further information, contact:

Audubon International
46 Rarick Road
Selkirk, NY 12158
Tel: (518) 767-9051
Fax: (518) 767-9076

- A series of fact sheets will soon be available on the environmental effects of pesticide use on golf courses.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

## H.14 Ground Water (also see "Water Wells")

- *Interim Guidelines for the Evaluation of Ground Water Supply for Unserviced Residential Subdivisions Using Privately Owned Domestic Water Wells*

  This document is primarily intended for municipalities, subdivision approving authorities, developers, and consultants. Individual landowners may also find it informative. Use of the guidelines will help ensure careful consideration of the water requirements of a subdivision and the yield and quality of ground water.

- *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions*

  This document is primarily intended for municipalities, subdivision approving authorities, developers, and consultants. Individual landowners may also find it informative. Use of the guidelines will help reduce problems with septic tanks, house foundations, and access roads due to a high water table and waterlogged soil.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

For additional information on ground water, you may also contact:

Ground Water Information Centre
Water Management Division
Alberta Environment
10th Floor, 9820-106 Street
Edmonton, AB Tel: (780) 427-2770
T5K 2J6 Fax: (780) 427-1214

## H.15 Guidelines

Some examples of important guidelines related to water use management are listed below.

- *Canadian Water Quality Guidelines*

For further information, contact:

Guidelines and Standards Division, SPEQB
Environment Canada
Vincent Massey Place
351 – 8th Floor Saint Joseph
Ottawa, ON
K1A 0H3 Tel: (819) 953-1550

- *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, 1997

For further information, contact:

Queen's Printer Book Store
Main Floor, McDougall Centre
455 – 6 Street SW Tel: (403) 297-6251
Calgary, AB Fax: (403) 297-8450
T2P 4E8 Internet: www.qp.gov.ab.ca/display_ acts.cfm

- *Stormwater Management Guidelines for the Province of Alberta*, 1999
- *Guidelines for Industrial Landfills*, 1987
- *Hazardous Wastes Storage Guidelines*, 1988
- *Environmental Reference Manual for the Review of Subdivisions in Alberta*

  This manual was developed to help subdivision approving authorities screen for, avoid, and/or resolve environmental aspects of subdivision applications. The manual is also helpful with respect to the environmental aspects of development reviews and as a reference document for the preparation of land use plans.

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*
- *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks*
- *Interim Guidelines for the Evaluation of Ground Water Supply for Unserviced Residential Subdivisions Using Privately Owned Domestic Water Wells*
- *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions*
- *Surface Water Quality Guidelines for Use in Alberta* (November, 1999)
- *Alberta Water Quality Guidelines for the Protection of Freshwater Aquatic Life: Dissolved Oxygen* (August, 1997)

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7

Tel: (403) 297-7605
Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre, Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## H.16 Hazardous Waste

### H.16.1 Industrial

- *Deep Well Injection of Industrial Wastes in Alberta*
- *Guidelines for the Disposal of Asbestos Wastes*, 1988
- *Hazardous Wastes Storage Guidelines*, 1988

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Guidelines for the Management of Wastes Containing PCBs*

For copies of this document, contact:

CCME Publications
c/o Manitoba Statutory Publications Tel: (204) 945-4664
Lower Level, 200 Vaughan Street Fax: (204) 945-7172
Winnipeg, MB E-mail: spccme@chc.gov.mb.ca
R3C 1T5 Internet: http://www.ccme.ca/4e_publications/4e.html

### H.16.2 Household

- Hazardous waste fact sheets
- *Don't Give Hazardous Wastes a Home*
- *Household Hazardous Wastes Handbook: A Guideline to the Identification and Disposal of Potentially Hazardous Wastes*
- *Leaf and Yard Waste Composting Manual*

For further information, contact:

| | |
|---|---|
| Alberta Environment, Southern Region<br>203, 2938 – 11 Street NE<br>Calgary, AB<br>T2E 7L7 | Tel: (403) 297-7605<br>Fax: (403) 297-5944 |

For copies of the fact sheets, contact:

| | |
|---|---|
| Information Centre<br>Alberta Environment<br>100, 3115 – 12 Street NE<br>Calgary, AB<br>T2E 7J2 | Tel: (403) 297-3362<br>Fax: (403) 297-2843 |

Website: www.gov.ab.ca/env/info/infocentre

## H.17 Industrial and Commercial Pretreatment of Wastewater

The City of Calgary's procedures are an example of current best management practice for pretreatment of wastewater. The City of Calgary controls wastewater discharge into the collection system through the *Sewer Service Bylaw*. Industries with high-strength sewage are encouraged to provide pretreatment before discharging to the sanitary sewer. Throughout the city, many industries such as food processors have elaborate pretreatment systems. Others may require a system as simple as a double sump. The incentive to install pretreatment relates to the surcharges imposed on above normal strength sewage and is calculated on a user-pay basis: "the more you load, the more you pay." The City's industrial testing program monitors discharges to the sanitary sewer system so that, where necessary, surcharges can be imposed and other aspects of the bylaw (e.g., prohibited materials) are adhered to.

For additional information on managing industrial and commercial discharges to a sewer system, contact:

| | |
|---|---|
| Plant Engineer<br>Wastewater Treatment Plants (#37)<br>City of Calgary<br>PO Box 2100, Station M<br>Calgary, AB<br>T2P 2M5 | Tel: (403) 268-3855<br>Fax: (403) 268-3838 |

## H.18 Instream Construction

- *Watercourse Crossing Guidelines*, 2nd Edition (final), November 1999, prepared by the Canadian Pipeline Water Crossing Committee

  The *Guidelines* are to provide a more consistent approach to planning, approval, and construction of pipeline watercourse crossings for the petroleum industry.

To obtain copies of the *Guidelines*, contact:

Kym Hopper-Smith
National Energy Board
444 - 7 Avenue SW
Calgary, AB
T2P 0X8
Tel: (403) 299-3890
Fax: (403) 292-5503

For further information, contact:

Ian Scott, Manager
Northern Canada and Pipelines
Canadian Association of Petroleum Producers
2100, 350 – 7 Avenue SW
Calgary, AB
T2P 3N9
Tel: (403) 267-1132
Fax: (403) 266-3261

- *Guide to the Code of Practice for Watercourse Crossings, Including Guidelines for Complying with the Code of Practice* (May 2000)

- *Guide to the Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body, Including Guidelines for Complying with the Code of Practice* (April 2000)

Information on the codes of practice can be obtained through Alberta Environment regional offices.

- *Fish Habitat Manual: Guidelines and Procedures for Watercourse Crossings in Alberta* (Alberta Infrastructure, 1999).

For a copy of this document, contact your local Alberta Transportation office.

## H.19 Instream Needs Determination

A variety of techniques are available for determining instream needs. The following people can provide information on techniques and their strengths and weaknesses for the different aspects of instream needs determination:

Fisheries
Allan Locke
Alberta Sustainable Resource Development
213 – 1 Street
Cochrane, AB
T0L 0W0
Tel: (403) 932-2388, ext. 226
Fax: (403) 932-2158

Riparian Vegetation
John Mahoney
Alberta Sustainable Resource Development
2nd Floor, 200 – 5 Avenue South
Lethbridge, AB
T1J 4C7
Tel: (403) 382-4365
Fax: (403) 381-5723

Recreation
Don Cockerton
Alberta Community Development
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-5969
Fax: (403) 297-6069

Water Quality
Al Sosiak
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-5921
Fax: (403) 297-6069

Aesthetics
Bob Morrison
Alberta Environment, Southern Region
303, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-6462
Fax: (403) 297-6069

## H.20 Landfills

- *Code of Practice – Landfills*

For further information, contact:

Queen's Printer Book Store
Main Floor, McDougall Centre
455 – 6 Street SW Tel: (403) 297-6251
Calgary, AB Fax: (403) 297-8450
T2P 4E8 Internet: www.qp.gov.ab.ca/display_ acts.cfm

- *Guidelines for Industrial Landfills*, 1987
- *Draft Standards and Guidelines for Landfills in Alberta*
- *Sanitary Landfill Controlling Wind-Blown Litter*

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of the guidelines, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## H.21 Land Reclamation

A wide variety of guides, information letters, reference manuals, and fact sheets are available on land reclamation. These include:

- *Guide for Pipelines*
- *Guide for Pits*
- *Conservation and Reclamation Guidelines for Alberta*

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2
Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

Research reports published by the Reclamation Research Technical Advisory Committee are available through:

Queen's Printer Book Store
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8
Tel: (403) 297-6251
Fax: (403) 297-8450
Internet: www.qp.gov.ab.ca/display_ acts.cfm

## H.22 Land Use Guidelines

- *Slope and Break Setback Guidelines for Wellsites and Associated Infrastructure*

  These are guidelines for safe setback distances for oil and gas wellsites near ravines and rivers.

  (Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996)

For further information, contact:

Director
Public Land Allocation and Management
Alberta Sustainable Resource Development
201, 7000 – 113 Street
Edmonton, AB
T6H 5T6
Tel: (780) 427-6597
Fax: (780) 422-4244

- *Fisheries Habitat Protection Guidelines*

  These are a series of guidelines for geophysical operations, wellsites, pipeline construction, vehicular access across watercourses, timber harvesting, and feedlots. They include protection and reclamation of riparian habitat and minimum setbacks for some activities.

  (Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996)

For further information, contact:

Alberta Sustainable Resource Development
2nd Floor, 9920 – 108 Street
Edmonton, AB Tel: (780) 427-7581
T5K 2M4 Fax: (780) 422-9559

- *Environmental Reference Manual for the Review of Subdivisions in Alberta*

  This manual was developed to help subdivision approving authorities screen for, avoid, and/or resolve environmental aspects of subdivision applications. The manual is also helpful with respect to the environmental aspects of development reviews and as a reference document for the preparation of land use plans.

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*
- *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks*
- *Interim Guidelines for the Evaluation of Ground Water Supply for Unserviced Residential Subdivisions Using Privately Owned Domestic Water Wells*
- *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions*

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2

Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Stream Crossing Guidelines: Operational Guidelines for Industry*
- *Resource Road Planning Guidelines*
- *Predisturbance Watershed Assessment Manual*
- *Provincial Geophysical Guidelines*
- *The Resource Handbook: Operational Guidelines for Industry*
- *Culvert Sizing for Stream Crossings: A Handbook of Three Common Methods*

These are guidelines commonly used in setting operating conditions where access or occupancy has been approved to explore or develop resources on Crown land in the Green Area.

In timber harvesting operations, detailed ground rules (*The Alberta Timber Harvest Planning and Operating Ground Rules*, 1994) describe how timber harvesting is to be carried out. In addition to the ground rules, companies may be required to follow guidelines contained in the above manuals. For example, water source areas are identified using procedures described in the *Predisturbance Watershed Assessment Manual*.

Where access or occupancy has been approved to explore or develop oil and gas resources, the company must follow specific operating conditions. These operating conditions specify how operations such as stream crossings, road construction, debris disposal, and reclamation are to be carried out to protect the watershed.

For further information, contact:

Alberta Sustainable Resource Development Tel: (780) 427-3932

Also see the following topics:

- Feedlots (Section H.9)
- flood damage reduction (Section H.11)
- land reclamation (Section H.21)
- petroleum storage tank management (Section H.25)

- riparian land and shoreline use (Section H.27)
- stormwater (Section H.31)
- water and wastewater treatment (Section H.37)
- water wells (Section H.38)

## H.23 Modeling

### H.23.1 Water Quality Modeling

There are a number of analytical techniques, including modeling, that can be used to predict and assess water quality. Each technique has its strengths and weaknesses. Water quality modeling is the simulation, usually computerized, of current and/or future water quality conditions. Any water quality modeling done for the Bow Basin Plan will be managed by the Water Sciences Branch of Alberta Environment.

For further information, contact:

Darcy McDonald, Water Sciences Branch
Alberta Environment
10th Floor, 9820 – 106 Street
Edmonton, AB
T5K 2J6
Tel: (780) 415-8780
Fax: (780) 422-6712

### H.23.2 Water Quantity Modeling

The Bow Basin Plan will rely on water quantity modeling provided by Alberta Environment. The primary water quantity model used for planning in the South Saskatchewan River Basin is the Water Resources Management Model (WRMM). A *Program Description* of WRMM is available.

For further information, contact:

Alberta Environment, Southern Region
2nd Floor, 3115 – 12 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-6563
Fax: (403) 297-2749

## H.24 Pesticides

A wide variety of fact sheets, brochures, and manuals are available on the control of pests and the proper and effective use of pesticides. Some examples are provided below. New information materials are frequently developed, so ask for any new or additional material.

- *Environmental Code of Practice for Pesticides*

For further information, contact:

Queen's Printer Book Store
Main Floor, McDougall Centre
455 – 6 Street SW
Calgary, AB
T2P 4E8
Tel: (403) 297-6251
Fax: (403) 297-8450
Internet: www.qp.gov.ab.ca/display_ acts.cfm

- Fact sheets:
  - *Pesticide Storage: Regulatory Requirements and Guidelines (Schedule 1 and 2 Pesticides)*
  - *Schedule 1 Pesticides: Notice to Purchasers*
  - *Retail Vendor Requirements: Acreage Owners and Hobby Greenhouse Operators*
  - *Commercial Wholesale Vendor Requirements*
  - *Commercial Retail Vendor Requirements*
  - *Domestic Pesticides: Wholesale/Retail Vendor Requirements*
  - *Pesticides Services*
  - *Procedures for Grain Bin Fumigation*
  - *Procedures for Greenhouse Fumigation*
  - *Killing of Honey Bees with Calcium Cyanide*
  - *Special Use Approval* – contains specific requirements relating to water
- Brochures:
  - *Pest Control for Homeowners*

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre, Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2
Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Backyard Pest Management in Alberta* (for homeowners) AGDEX 605-2 $5+GST
- *Crop Protection with Chemicals* (for farmers and commercial operators) AGDEX 606-1 $10+GST
- *Practical Crop Protection* (non-chemical control of pests) AGDEX 606-3 $10+GST
- *Pesticide Application Equipment* AGDEX 744-5 $10+GST
- *Recognizing Herbicide Action and Injury* AGDEX 606-4 $8+GST
- *How Herbicides Work – Mechanisms of Action* $25+GST

You can obtain copies of these documents from your district office of Alberta Agriculture, Food and Rural Development or by writing to:

Publishing Branch
Alberta Agriculture, Food and Rural Development
7000 – 113 Street
Edmonton, AB
T6H 5T6

Note: There is a $2+GST shipping and handling charge per order when ordering by mail from the Publishing Branch.

- *Industry Standards and Good Practices for Vegetation Management*, by Industrial Vegetation Management Association of Alberta (IVMAA) $50+GST for members of IVMAA. $75+GST for non-members. $40+GST per copy for orders of 25 or more.

  This is a guide and reference source that contains guidelines for all aspects of vegetation management, from planning and conducting programs to proper clean-up and emergency response.

For further information, contact:

Industrial Vegetation Management Association of Alberta
410, 2424- 4 Street SW
Calgary, AB
T2S 2T4 Tel: (403) 244-4905

## H.25 Petroleum Storage Tank Management

- *Commonly Asked Questions About Underground Storage Tanks*
- *Remediation Guidelines for Petroleum Storage Tank Sites* (draft), 1994

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax:(403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

## H.26 Raptor Protection (e.g., eagles, falcons, hawks, owls)

- *A Landowner's Guide to Prairie Raptors* by Geoffrey Holroyd, Ivan Shukster, Diane Keith, and Laurie Hunt, Canadian Wildlife Service, 1995

  This document provides information for identifying raptors and methods of protecting raptors and their habitat and can be found on the Internet at:

  http://www.pnr-rpn.ec.gc.ca/nature/migratorybirds/raptors/dc17s00.en.html

For further information, contact:

Communications Directorate
Canadian Wildlife Service
Environment Canada
200, 4999 – 98 Avenue
Edmonton, AB
T6B 2X3

For further information on raptors and their habitat, contact your local Alberta Sustainable Resource Development wildlife officer by calling 297-6423 in Calgary or, outside of Calgary, call 310-000 and ask for Wildlife Management.

## H.27 Riparian Land and Shoreline Use

- *Caring for the Green Zone – Riparian Areas and Grazing Management*

  This is a guidebook for livestock producers and landowners explaining how riparian systems work, practices that can disturb their healthy function, and grazing strategies to keep them healthy.

For further information, contact:

Norine Ambrose, Program Manager
Cows and Fish Program
c/o Alberta Environment
530 – 8 Street South
Lethbridge, AB
T1J 4C7
Tel: (403) 381-5538
Fax: (403) 381-5723
E-mail: riparian@telusplanet.net

Lorne Fitch, Provincial Riparian Specialist
Alberta Sustainable Resource Development
530 – 8 Street South
Lethbridge, AB
T1J 4C7
Tel: (403) 381-5281
Fax: (403) 381-5723

Barry Adams
Public Land Service
Alberta Sustainable Resource Development
#100, 5401 - 1 Ave. South
Lethbridge, AB
T1J 4V6
Tel: (403) 381-5486
Fax: (403) 381-5792

- *Management Strategy for Exposed Bed and Shore on Public Lands* (applies to northern Alberta only)

  This strategy provides principles, guidelines, and direction for northeast and northwest Alberta in dealing with ecological and agricultural concerns relating to newly exposed bed and shore areas as a result of drying lakes in the region.

(Source: *Annotated Guide to Alberta's Legislation, Policies and Programs Affecting Wildlife Management*, by Jim Fenton and John Lilley, North American Waterfowl Management Plan, 1996)

- *Caring for Shoreline Properties* (Alberta Conservation Association and Alberta Environment, 1999)

  This is a guidebook for lakeshore owners that explains the importance of maintaining natural shorelines. It also explains regulatory requirements and provides guidelines for shoreline use and restoration.

For further information, contact:

Alberta Sustainable Resource Development
200, 7000 – 113 Street
Edmonton, AB
T6H 5T6
Tel: (780) 427-3595
Fax: (780) 422-4244

Also see the section on land use guidelines (Section H.22).

## H.28 Septic Tanks

- *State of the Art Review: Septic Tank – Disposal Field Systems*

For further information, contact:

Alberta Municipal Affairs
Safety Services South
7th Floor, 727 – 7 Avenue SW
Calgary, AB
T2P 0Z5
Tel: (403) 297-5759
Fax: (403) 297-4174

Alberta Municipal Affairs
Safety Services North
16th Floor, Commerce Place
10155 – 102 Street
Edmonton, AB
T5J 4L4
Tel: (780) 427-8686
Fax: (780) 422-9645

## H.29 Snow Disposal

- *Snow Disposal Guidelines for the Province of Alberta*

For further information, contact:

| | |
|---|---|
| Alberta Environment, Southern Region | |
| 203, 2938 – 11 Street NE | |
| Calgary, AB | Tel: (403) 297-7605 |
| T2E 7L7 | Fax: (403) 297-5944 |

For copies of this document, contact:

| | |
|---|---|
| Information Centre | |
| Alberta Environment | |
| 100, 3115 – 12 Street NE | |
| Calgary, AB | Tel: (403) 297-3362 |
| T2E 7J2 | Fax: (403) 297-2843 |

Website: www.gov.ab.ca/env/info/infocentre

## H.30 Standards

- *Industrial Effluent Limits Policy and Overview*
- *Summary of Alberta Standards and Monitoring Requirements*
- *User's Guide on WL (Waste Loading) Screen*
- *Water Quality Based Effluent Limits Procedures Manual*

For further information, contact:

| | |
|---|---|
| Alberta Environment, Southern Region | |
| 203, 2938 – 11 Street NE | |
| Calgary, AB | Tel: (403) 297-7605 |
| T2E 7L7 | Fax: (403) 297-5944 |

For copies of these documents, contact:

| | |
|---|---|
| Information Centre | |
| Alberta Environment | |
| 100, 3115 – 12 Street NE | |
| Calgary, AB | Tel: (403) 297-3362 |
| T2E 7J2 | Fax: (403) 297-2843 |

Website: www.gov.ab.ca/env/info/infocentre

## H.31 Stormwater

- *Stormwater Management Guidelines for the Province of Alberta* (1999)
- *Draft Guidelines for the Approval and Design of Constructed Treatment Wetlands for Water Quality Improvement* (1998)

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

For copies of these documents, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB Tel: (403) 297-3362
T2E 7J2 Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems* (1997)

For further information, contact:

Queen's Printer Book Store
Main Floor, McDougall Centre
455 – 6 Street SW Tel: (403) 297-6251
Calgary, AB Fax: (403) 297-8450
T2P 4E8 Internet: www.qp.gov.ab.ca/display_ acts.cfm

- *A Guideline for the Application and Approval of Municipal Waterworks, Wastewater and Storm Drainage Systems under the New Alberta Environmental Protection and Enhancement Act*

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB Tel: (403) 297-7605
T2E 7L7 Fax: (403) 297-5944

## H.32 Subdivision Approval

See the section on land use guidelines (section H.22).

## H.33 Sump Management (e.g., for car washes)

See the section on industrial and commercial pretreatment of wastewater (section H.17).

## H.34 Sustainable Development

- *Alberta's Commitment to Sustainable Resource and Environmental Management*

  Endorsed by the Premier and Cabinet, this document describes the sustainable approach to environmental and natural resource management that will be used by the Alberta Government to ensure that environmental health and prosperity continue to co-exist.

For further information, contact:

Information Centre
Alberta Environment
100, 3115 – 12 Street NE
Calgary, AB
T2E 7J2
Tel: (403) 297-3362
Fax: (403) 297-2843

Website: www.gov.ab.ca/env/info/infocentre

- *Toward Sustainable Communities: A Resource Book for Municipal and Local Governments* prepared by the National Round Table on the Environment and the Economy (NRTEE). ISBN: 086 571 374X

For further information, contact:

Renouf Publishing Co. Ltd.
5369 Canotek Road, Unit #1
Ottawa, ON
K1J 9J3
Tel: (613) 745-2665
Fax: (613) 745-7660
E-mail: order.dept@renoufbooks.com
Internet: http://www.renoufbooks.com

## H.35 Timber Harvesting

See forest management (section H.12).

## H.36 Waste Management (Action on Waste Program)

The Action on Waste Program offers a wide variety of resource materials to assist municipalities, businesses, and the general public in identifying and understanding waste minimization issues, options, and solutions. A catalogue of resource materials is available.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

## H.37 Water and Wastewater Treatment

A variety of guides, guidelines, standards, manuals, and other documents are available on the treatment of drinking water and industrial and municipal wastewater treatment.

For further information, contact:

Alberta Environment, Southern Region
203, 2938 – 11 Street NE
Calgary, AB
T2E 7L7
Tel: (403) 297-7605
Fax: (403) 297-5944

## H.38 Water Wells (also see Ground Water)

- *How to Shock Chlorinate Your Water Well*
- *Water Wells That Last for Generations*
  Under the Water Wells That Last Program, a series of three videos and a 90-page manual have been released. The videos deal with issues related to planning, constructing, managing, maintaining, and shock chlorinating a well. The manual *Water Wells That Last for Generations* is a reference source on issues related to ground water wells including well construction, understanding present and future needs, troubleshooting problems, and properly plugging unused wells.

For further information, contact:

Monitoring Division
Alberta Environment
10th Floor, 9820 – 106 Street
Edmonton, AB Tel: (780) 427-2770
T5K 2J6 Fax: (780) 427-1214

Regulatory Assurance Division
Alberta Environment
9th Floor, 9820 – 106 Street
Edmonton, AB Tel: (780) 449-3463
T5K 2J6 Fax: (780) 449-3465

# I. Glossary

| | |
|---|---|
| AAFRD | Alberta Department of Agriculture, Food and Rural Development |
| accretion | As used in the *Guidebook*, "accretion" is the gradual and imperceptible accumulation of land on a shore due to natural causes. Accretion is a process. The land that results is called "accreted land." |
| administrative penalty | A fine that can be imposed without going to court. The fine can be appealed. |
| adverse effect | (a) As used in EPEA, "adverse effect" means "impairment of or damage to the environment, human health or safety or property."<br>(b) As used in the *Water Act*, "adverse effect" means "impairment of or damage to." |
| AENV | Alberta Department of Environment |
| AESA | Alberta Environmentally Sustainable Agriculture |
| allocation | (a) Assignment of resources to an activity.<br>(b) The volume, rate, and timing of water authorized for an activity, ecosystem requirement, or meeting interprovincial commitments. Examples of water allocation are a licence, temporary authority, policy or precedent (e.g., for ecosystem protection), statutory entitlement (e.g., for domestic use), intergovernmental agreement, and registration (for traditional agriculture use under the *Water Act*). |
| ambient | Surrounding or occurring before a location or before an activity occurs. Ambient temperature is the temperature of the surrounding air. Ambient water quality is the water quality in a river, lake, or other water body, as opposed to the quality of water being discharged. In a river or stream, ambient water quality usually refers to the water upstream of a discharge point. |
| aquifer | An underground water-bearing formation that is capable of yielding water. |
| assimilative capacity | The ability of a water body to purify or remove contaminants from wastewater. |
| augmentation | In water management, "augmentation" means an increase in the flow or water level due to diversion of water or release of stored water into a water body. |

| | |
|---|---|
| auspices | The support, direction, sponsorship, or mandate of a person or organization. |
| AWRC | Alberta Water Resources Commission |
| bed and shores | The bed and shores of a body of water are the land covered so long by the water as to wrest it from vegetation or as to mark a distinct character on the vegetation where it extends into the water or on the soil itself. See also, the definition of bank, bed, and shore in section 17(2) and (3) of the *Surveys Act*. |
| beneficial use | The allocation of water for a specific purpose to achieve economic, social, and/or environmental benefits, while maximizing the returns to the user. Examples of beneficial uses are:<br>(a) Diversion of water to meet the needs of an authorized use employing best management practices<br>(b) Maintenance of flow or water level to satisfy instream needs or uses or ecosystem protection. |
| best management practices | Techniques and procedures that have been proven (through research, testing, and use) to be the most effective and appropriate for use in Alberta. Effectiveness and appropriateness are determined by a combination of:<br>▪ the efficiency of resource use<br>▪ the availability and evaluation of practical alternatives<br>▪ the creation of social, economic, and environmental benefits<br>▪ the reduction of social, economic, and environmental negative impacts. |
| bilateral | Participated in by two governments or organizations. |
| biochemical oxygen demand | The measure of the amount of oxygen consumed by aquatic organisms in the degradation of organic material. This is important because it is an indicator of how much oxygen will be removed from the water and the resulting stress on the aquatic ecosystem. |
| biodiversity | The variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, among species, and of ecosystems. Also called "biological diversity." |
| BOD | Biochemical oxygen demand (see above). |
| BPT | Best practicable technology. |

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| BRID | Bow River Irrigation District |
| CBOD | Carbonaceous Biochemical Oxygen Demand |
| CCME | Canadian Council of Ministers of the Environment |
| CEPA | *Canadian Environmental Protection Act* |
| certificate of variance | See "variance, certificate of." |
| cfs (cubic feet per second) | A measure of the volume of water passing a particular point each second. This volume of water is called the "rate of flow" or simply the "flow." |
| CHR | Calgary Health Region |
| CHRS | Canadian Heritage Rivers System |
| cistern | A tank for storing water or other liquid, usually placed above the ground. |
| CITES | *Convention on International Trade in Endangered Species* |
| commemorate | To honor the memory of. |
| communal | Of, by, belonging to, or serving the people of a community. |
| conservation | Conservation can mean different things to different people, e.g.:<br>▪ Reduce the amount of water consumed or diverted.<br>▪ Minimize waste.<br>▪ Manage water efficiently.<br>▪ Optimize water delivery and use.<br>▪ Protect the natural environment or instream needs.<br>▪ Protect against environmental degradation.<br>The definition of "conservation" for the Bow Plan is based on the definition of "conservation" from the *Water Act*.<br>Conservation includes, but is not limited to:<br>▪ improving efficiency, recycling, reuse, or reduction of wastage or losses. This includes optimizing water delivery and use.<br>▪ preserving and protecting the environment, which for the Bow Plan means developing instream needs and objectives and providing direction on how to meet the objectives. |

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| | The importance (weighting) of the different aspects of conservation may vary from reach to reach of a river. |
| consumptive water use | The net depletion of water from a water source by withdrawals. It is calculated with the following formula:<br>$C = GD - RF$<br>where<br>C = Consumption: the amount of water that, once diverted, does not return directly and within a short period of time to the water system from which it was diverted.<br>GD = Gross Diversion: the amount of water initially diverted from a water body or aquifer.<br>RF = Return Flow: the amount of water that goes directly and within a short period of time back to the water system from which it was diverted.<br>The calculation of consumption must take into account water that is inadvertently, but naturally diverted into a water system after an authorized diversion has occurred. Examples of these diversions are local precipitation and runoff that enters a canal and ground water seepage into sewers.<br>This definition of consumption is based on the point of diversion from a river. Other definitions of consumption can be used depending on the "accounting stance" adopted. Other definitions may need to be employed to take into account such factors as the location of return flow within a river reach and on-farm vs. system efficiency. |
| contaminant | A substance that, in a sufficient concentration, will render water, land, fish, or other thing unusable or harmful. |
| coulee | (a) A deep ravine, gully, or gulch, usually dry, that has been created by running water.<br>(b) A small, intermittent stream. |
| CPR | Canadian Pacific Railway Company Ltd. |
| criteria | See "performance measures." |
| Crown | (a) A short form for the provincial or federal government based on the phrase "Her majesty in the right of …"<br>(b) Owned or managed by the federal or provincial government. |

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| cutblock layout | The pattern of approved or actual cutting of trees within an area designated for timber harvest. |
| CWS | Canadian Wildlife Service |
| decommission | To retire (a plant or facility) from active service. |
| deficit | When demand exceeds supply, the difference between (a) water demand and (b) the water supplied either at the point of diversion (for a withdrawal use) or in a water body (for an instream use or ecosystem protection).<br>$DF = D - S$ [if $D>S$]<br>where<br>DF = deficit<br>D = demand<br>S = supply |
| deleterious substance | For the purposes of sections 35 to 43 of the *Fisheries Act*, a deleterious substance is:<br>(a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or<br>(b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water. |
| development | The use of land, water, or other natural resources that requires change in the use or allocation of the resource. Usually when the term "development" is used, it refers to long-term, substantial change to the resource or the surrounding environment. |
| diminution | Diminishing. Lessening. Reduction. |
| dissemination | Spreading information widely. |
| ditchrider | A person who delivers water to a portion of an irrigation district. |

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| diversion (divert) | For the purposes of the *Water Act*:<br>(i) the impoundment, storage, consumption, taking or removal of water for any purpose, except the taking or removal for the sole purpose of removing an ice jam, drainage, flood control, erosion control or channel realignment, and<br>(ii) any other thing defined as a diversion in the regulations. |
| double sump | A two-chambered tank or pit into which water drains. The design allows floating material (called "floatables") to be trapped at the surface while other solids settle to and remain at the bottom. |
| drain | A conduit, channel, or other structure constructed or used to carry water or wastewater by gravity or pumping. |
| drainage area | The area drained by a natural water body or a man-made system. Also called a catchment area. |
| dry pond | Relief systems which provide a diversion of excess flow from a storm sewer trunk to an impoundment for temporary storage. A dry pond is often a playground or other open space not normally covered by water. A dry pond reduces flooding downstream. |
| EAB | Environmental Appeal Board |
| ecological reserve | An area designated under the *Wilderness Areas, Ecological Reserves and Natural Areas Act* where human activities are limited to those with no or minimal effects. Many human activities, particularly industrial, are prohibited in ecological reserves. |
| ecology | (a) The ecosystem<br>(b) A branch of biology dealing with the relations between organisms and their environment, also known as environmental biology. |
| ecosystem | A community of interdependent organisms together with the environment which they inhabit and with which they interact. |
| ecozone | A large area with similar ecosystems. The Partners FOR the Saskatchewan River Basin use four ecozones for the Saskatchewan River Basin: Montane Cordillera (Rocky Mountains), Boreal Plains (aspen parkland), Boreal Shield (Canadian Shield), and Prairie. |

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| efficiency | The ratio between (a) water consumed to directly meet the needs of an authorized use and (b) gross diversion. Losses and other secondary or consequential consumption of water are not considered to be water consumed directly.<br>In situations where a water system is meeting multiple uses, the calculation of efficiency should be done separately for each type of allocation. This ensures that the calculation is a true reflection of the efficiency of water allocated for a specific purpose.<br>For irrigation, efficiency is the net amount of diverted water that is added to the root zone divided by the amount of water diverted. |
| effluent | In terms of wastewater management, "effluent" is the liquid waste of municipalities, industries, or agricultural operations. Usually the term refers to a treated liquid released from a wastewater treatment process. |
| EIA | Environmental impact assessment |
| EID | Eastern Irrigation District |
| enforcement order | Under EPEA and the *Water Act*, a legal document requiring a person to stop an activity, fix a problem, or restore the environment. |
| environment | Under EPEA and the *Water Act*, the "environment" is comprised of the components of the earth including:<br>(i) air, land and water,<br>(ii) all layers of the atmosphere,<br>(iii) all organic and inorganic matter and living organisms, and<br>(iv) the interacting natural systems that include components referred to in subclasses (i) to (iii) |
| environmental assessment | A process that predicts and evaluates the beneficial and detrimental social, economic, and ecological consequences of development. In some cases, this means that a formal environmental impact assessment report is required. |
| environmental effects | Changes to the ecology or human activities. The changes may be short-term or long-term. |
| environmental impact assessment | See "environmental assessment." |
| environmental protection order | Under EPEA, a legal document that is intended to prevent environmental problems or, failing that, to ensure that action is taken to fix environmental problems. |

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| EPAC | Environmental Protection Advisory Committee |
| EPEA | *Environmental Protection and Enhancement Act* |
| EUB | Alberta Energy and Utilities Board |
| FDRP | Flood Damage Reduction Program |
| fishery | An area of water inhabited by fish. |
| flood fringe | As used for the FDRP, the part of a floodplain where, during a flood, the water is shallower (<1m in depth) and moves more slowly (velocity <1 m/sec). Contrast "floodway." |
| floodplain | The land adjacent to a river or other water body that is subject to flooding. In the FDRP, the size of the floodplain is defined by the 1-in-100 year floodplain, the land that has a 1% chance of being flooded in any year. |
| floodprone | Located in such a way that it is subject to flooding. |
| floodproofing | To protect land, buildings, and other property from flood damage, e.g., by building living quarters higher than where the flood waters would be. |
| floodway | As used for the FDRP, the part of a floodplain that, during a flood has the deepest, fastest, and most destructive flow of water. Contrast "flood fringe." |
| FMA | Forest management agreement |
| FMU | Forest Management Unit |
| FREWG | Fisheries and Recreation Enhancement Working Group |
| geophysical line | Corridors cleared of much of the vegetation so that data can be collected on the physics of the earth. In Alberta, this is usually done for seismic investigations. |
| grassroots | Originating from the local community or ordinary people. |
| Green Area | The Green Area, established in1948 by Alberta Order-in-Council 213/48, consists of non-settled forest lands and covers approximately 50% of the total area of the Province of Alberta. Public lands in the Green Area are managed primarily for forest production, watershed protection, fish and wildlife management, recreation, and other multiple uses. Permanent settlement, except for legally subdivided lands and agricultural uses other than grazing, have been excluded. |

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| ground water | Water under the surface of the ground. The upper limit of the ground water is called the water table. |
| guidelines | See "performance measures." |
| gully | A narrow ravine or small coulee. |
| habitat | (a) The part of the physical and biological environment in which a plant or animal lives and which provides the essential ingredients for survival.<br>(b) The place where an animal or plant lives. |
| hazardous waste | (a) Waste that has one or more of the properties described in Schedule 1 of the *Waste Control Regulation* (AR 192/96) of EPEA.<br>(b) Waste that contains a substance harmful to life. The substance may be toxic (e.g., pesticides, compounds of arsenic, cyanides), flammable (e.g., hydrocarbons), corrosive (strong acids or alkalis), or oxidizing (e.g., nitrates or chromates). Some may be hazardous in more than one way. |
| headgate | A gate at the entrance to a canal, ditch, conduit, or pipeline. |
| headwaters | The source and upper tributaries of a stream. |
| headworks | All structures and associated facilities located at the beginning of a water management project. In the case of the headworks owned by Alberta Environment, this includes the structure for diverting water from the river (e.g., a dam or weir) and facilities for carrying and storing water (canal and reservoir/s). |
| ID | Irrigation district |
| impoundment | Storage of water |
| IN | Instream needs |
| infrastructure | Physical facilities such as canals, reservoirs, pipelines, and treatment plants. |
| instream | Occurring or related to water in a river, stream, or other body of water. |
| instream needs | The flow and water quality required to satisfy instream uses of water and to protect the river ecology and riparian environments. Instream needs include fish habitat, water quality, riparian vegetation, channel structure, and recreation uses. |

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| instream objectives | Targets for flow and water quality in a water body that are derived through compromises and trade-offs among instream needs, withdrawal uses, and effluent discharge requirements. |
| intensive forest management | Efforts designed primarily to maximize the production of a single product (such as timber, forage, wildlife habitat, and tourism development). In the case of forest management for fiber production, management practices are undertaken to increase the productivity of timber stands above that of unmanaged stands or stands managed to basic or extensive forest management standards. |
| *inter alia* | Among other things. |
| inter-governmental | Between governments. |
| inter-jurisdictional | Between organizations with different authority, usually authority over different territory. |
| IRP | Integrated resource plan. |
| IVMAA | Industrial Vegetation Management Association of Alberta |
| jurisdiction | The extent or range of authority over people, land, resources, or activities. |
| lagoon | (a) A shallow pond or lake.<br>(b) A small, artificial body of water usually composed of several cells or compartments used to treat wastewater to a secondary level of treatment. |
| landfarm | Subject to approval under EPEA and other relevant legislation, the placement of waste on or in land as a means of treating the waste. |
| LFD | Land and Forest Division |
| licence | Formal permission from a regulatory authority to do something, such as divert water or catch fish. Under the *Water Act*, a licence is required before water can be diverted and/or used except for household purposes or traditional agriculture uses. |
| linear disturbances | Pipelines, roads, seismic lines, and other uses of the land that involve a relatively narrow corridor. |

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| local authority | In Alberta, a local authority is a municipal government and sometimes other public organization (e.g., an irrigation district) to which the provincial government, through an act of the legislature, has granted decision-making power over part of the province. The specific definition of what is considered to be a local authority differs from one piece of legislation to another. |
| mainstem | (a) The primary channel of a river.<br>(b) The primary river in a drainage basin. |
| mandate | Authorization to act in a particular way on a public issue, granted by the voters or the government. |
| marsh | A water body covered, at least part of the time, by water and characterized by aquatic and grasslike vegetation, especially without peat-like accumulation. |
| MGA | *Municipal Government Act* |
| ministerial order | A legal document issued by a provincial or federal cabinet minister that grants authority or requires action to be taken. |
| mitigate | To reduce the negative effects of an activity. |
| mixing zone | A reach of a river downstream from a point of effluent discharge where the level of contamination from the effluent is not uniformly spread across the width of the river. |
| MR | Municipal reserve. |
| MSR | Municipal school reserve. |
| multilateral | Participated in by two or more governments or organizations. |
| multiple use | (a) Allowing natural resources to be used for more than one purpose.<br>(b) Allowing more than one use to be met at the same time. |
| municipal use | Municipal use includes purposes usually served by water within a city, town, or village such as household and sanitary purposes, watering of lawns and gardens, and fire protection. |
| natural area | An area designated under the *Wilderness Areas, Ecological Reserves and Natural Areas Act* to protect scenic and sensitive landscapes of local and regional significance while providing opportunities for education, nature appreciation, and low-intensity recreation. |

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| natural heritage | The physical and biological resources such as water, land, and vegetation that have been passed on to us by previous generations. |
| natural resources | (a) All components of the biological and physical environment.<br>(b) All components of the biological and physical environment that are valued by people. |
| navigable water | A body of water that is deep and wide enough for a boat or other floating object to be transported from one place to another. Navigable water includes any body of water capable, in its natural state, of being navigated by floating vessels of any description for the purposes of transportation, recreation, or commerce; as well as any waterway where the public right to navigation exists by dedication of the waterway for public purposes, or by the public having acquired the right to navigate through long use. |
| NAWMP | North American Waterfowl Management Program |
| non-consumptive water use | A use of water such as fishing or boating that does not result in a measurable reduction in the quantity of water in a water body. |
| non-governmental organization | Generally defined as a community-based group or agency with charitable or non-profit status that, except in rare cases, does not have a mandate from the government. |
| non-profit | Not yielding a monetary return. Not entered into for profit. |
| non-renewable resource | A material such as oil and gas that will not be replenished in a relatively short period of time. |
| NRCB | Natural Resources Conservation Board |
| objectives | See "performance measures." |
| oilfield injection | The addition of water into an oil-bearing formation to increase the amount of oil that can be extracted. |
| one-zone floodplain | A flood risk area where no consideration is given to differences within the flooded area in terms of depth, speed, and destructiveness of water during a flood. |
| outfall | The point at which a pipe or channel discharges to a water body. |
| pathogenic organism | A virus, bacteria, or other life form, producing or capable of producing disease. |
| PCAP | Prairie Conservation Action Plan. |

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| peatland | Permanent wetlands characterized by a bed with a highly organic soil (>50% combustible) composed of partially decayed plant material. Commonly referred to as muskeg. |
| performance measures | A tool used to determine whether or not success has been achieved. A performance measure is often called a "yardstick" since, like a ruler, it shows how far someone or something must go to accomplish a goal.<br>Performance measures come in a variety of forms. They can be simple or complex. They can use numbers or they can be expressed in words. They can be a single measure that identifies the line between success and failure or they can have two or more levels showing different degrees of achievement. Some of the performance measures used in water management are:<br>Criterion: A specific, numerical performance measure that is not legally binding unless designated in legislation.<br>Guideline: A specific performance measure that is not legally binding unless designated in legislation. It is a guide or indication of a future course of action. It describes how something will be accomplished. It may contain numerical performance measures and may deal with multiple uses of water.<br>Objective: A performance measure that is not legally binding unless designated in legislation. It is a purpose, target, or goal. It describes what is to be accomplished. It may contain numerical performance measures and may deal with multiple uses of water.<br>Policy: A statement of intent that is not legally binding. It sets direction and expectations for activities.<br>Principle: A fundamental, general rule for action or conduct that is not legally binding.<br>Standard: A legally-binding requirement, often established through a law or regulation, that is used to judge compliance. |
| permit | A document granting permission to do something. |
| PFRA | Prairie Farm Rehabilitation Administration |
| policy | See "performance measures" |
| pollution | Contamination or impairment. |

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| potable | (a) Suitable for drinking.<br>(b) Under EPEA, "potable water" is water that is supplied by a waterworks system and is used for drinking, cooking, bathing, dishwashing or other domestic purposes. |
| PPWB | Prairie Provinces Water Board |
| primeval | Pertaining to the first ages of the Earth. |
| principle | See "performance measures" |
| proprietary right | A title or claim to ownership or control of property. |
| public land | Land owned by a federal, provincial, or municipal government. Usually in the *Guidebook*, "public land" refers to land owned by the provincial government. |
| PUL | Public utility lot. |
| ravine | A small or narrow valley with steeply sloping sides. |
| reach | A portion of a waterway, often uniform with respect to discharge, size, slope, and other factors. |
| reclamation | Action to aid the recovery of land or other natural resources after an activity has ceased. This includes removal of equipment and buildings, decontamination, and stabilization and conservation of the land surface. Specific definitions of reclamation are provided in EPEA and its regulations. |
| reclamation certificate | Under EPEA, a document issued when an inspector is satisfied that conservation and reclamation has been completed. |
| recreation area | An area of land (usually relatively small) set aside by the provincial or municipal government to provide opportunities for outdoor recreation. |
| regime | (a) A method or system of law or government.<br>(b) The length, width, depth, slope, or other physical conditions that define a body of water. |
| registration | Under EPEA and the *Water Act* some activities (e.g., traditional agricultural uses) are required to obtain a registration and to be conducted so as to meet the environmental standards contained in the law, regulations, or codes of practice. |

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| regulations | Created under authority granted by a law, a regulation provides more specific requirements. |
| release | Under EPEA, "release" refers to the many ways, such as spills, discharges, leaks, spraying, and throwing something away, that contaminants can enter the environment. |
| relief stormwater trunk | A pipeline designed to receive an excess volume of water, stormwater, or wastewater. The purpose is flood protection. |
| remediation | The correction or improvement of something bad or undesirable. |
| renewable resource | A material such as water or trees that will be replenished in a relatively short period of time. |
| residual power | A general legal right left over after more specific powers have been taken into account. |
| resource base | The materials available or required to conduct an activity. |
| riparian | Located adjacent to a river or other water body. |
| riparian land | Land adjacent to a river or other water body. The land beyond the bank of a water body is also referred to as the riparian zone or riparian ecosystem. This recognizes that land beyond the edge of a water body is affected by such things as flooding and the flow of water from the river to ground water and vice versa. |
| riparian owner | A person who owns land along a water body. |
| riparian rights | The legal ability of a person owning or leasing land along a water body to use water and protect the quantity and quality of water in the water body. Riparian rights have been restricted by legislation in Alberta. |
| river basin | The land drained by a river and all of its tributaries. |
| RMA | Resource Management Area |
| RSA | *Revised Statutes of Alberta* |
| RSC | *Revised Statutes of Canada* |
| RVC | Calgary River Valleys Committee |
| SA | *Statutes of Alberta* |

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| SC | *Statutes of Canada* |
| secondary treatment | The second stage of treatment for cleaning wastewater. This stage of treatment is the standard requirement for municipalities and industries in Alberta. It is designed to reduce biochemical oxygen demand and suspended solids to acceptable levels. |
| sedimentation | The process of material settling out of water. |
| septic system | A combination of underground pipe(s) and holding tank(s) which is used to hold, decompose, and clean wastewater for subsurface disposal. |
| shore | The bed and shore of a body of water are the land covered so long by the water as to wrest it from vegetation or as to mark a distinct character on the vegetation where it extends into the water or on the soil itself. |
| siltation | The deposit of material in a water body through sedimentation. |
| slough | A marshy or reedy pool, pond, inlet, or backwater. |
| sludge | A generally semi-solid waste generated by a municipal, industrial, or commercial facility. The term is commonly used to describe the non-liquid waste generated by water and wastewater treatment systems. |
| socio-economic effects | Impacts on people and their activities, including impacts on personal and corporate finances, health, transportation, and recreation. |
| solid waste | Unwanted material that is not in a liquid or gaseous form. |
| spatial unit | An area of land and/or water. |
| special use | An activity that is not traditional or common. |
| SSBWAR | *South Saskatchewan Basin Water Allocation Regulation* |
| SSRB | South Saskatchewan River Basin |
| stakeholder | (a) A person or organization that has an interest or involvement in an issue or activity.<br>(c) A person or organization that is or may be directly affected by a decision or activity. |
| standards | See "performance measures." |
| stewardship | Management and protection of land or other resources for someone else, usually meaning society as a whole. |

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| stormwater | Run-off of water from the land due to precipitation or snow melt. |
| streamside buffers | A protected strip of vegetated land beside a water body. The purpose of the buffer is to reduce sediment entering the stream. During timber harvesting, removal of trees within buffers is allowed according to standards and guidelines contained in the ground rules. |
| sub-basin | A part of a river basin drained by a tributary or having characteristics that are significantly different from other areas in the basin. |
| surface water | Water on the surface of the earth. |
| suspended solids | Material such as fine particles of soil that neither dissolve in nor settle out of water, but instead are held or carried along in the water. |
| sustainable development | There is no single, commonly accepted definition of "sustainable development." These definitions show the range of views on the issue:<br>(a) Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.<br>(b) Use of a resource that does not preclude a future, alternative use.<br>(c) An activity using land, water, or other natural resources that occurs without unacceptable change to the human or natural environments or the resource base upon which it depends.<br>(d) The act of balancing human needs for resources with the maintenance of healthy natural ecosystems that support human existence. |
| swale | An intersection of two slopes on a piece of land resulting in a wide, shallow drainage way without a distinct bed or banks. |
| synoptic survey | An overview of water quality in a water body. Samples are taken from many sites to provide a "snapshot" of conditions. |
| TAU | TransAlta Utilities Corporation |
| tertiary treatment | A third stage of treatment for cleaning wastewater. There are several types of tertiary treatment including removal of nutrients (e.g., nitrogen, phosphorus) and disinfection. |
| timber disposition | A right or privilege, granted through a licence or permit, that allows timber operators to harvest trees from Crown lands. |
| toxic substance | A material that, if released into the environment in a sufficient concentration, is likely to kill humans, animals, or plants. |

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| TP | Total Phosphorus |
| transfer | In terms of the right to divert or use water, a transfer can be a change in:<br>a) ownership<br>b) type of use<br>c) priority, or<br>d) location where the diversion or use occurs<br>A change of ownership usually occurs when the land or works are sold. As a result, it is governed by the market for private property and does not require approval under the water Act. For the *Water Act*, the specific term "transfer" means a change in the location of the right. Under the *Water Act* , other changes in the right to divert or use water are handled through amendment to a licence. Water itself can be transformed through an assignment.<br>A change in the use, priority, or location of water rights in Alberta (as in most jurisdictions) must receive government approval. This is due to the potential to adversely affect other water users or the aquatic environment. |
| TSS | Total Suspended Solids |
| TUC | Trout Unlimited Canada or Transportation Utility Corridor |
| two-zone floodplain | A floodplain where a distinction is made between the floodway (where flood waters will be deeper, faster, and more destructive) and the flood fringe (where water is shallower and moves more slowly). |
| variance, application for | Under EPEA, a written request by the holder of an approval or registration or any other person engaged in an activity governed by the regulations to modify the approval, its terms or conditions, or a requirement of the regulations. |
| variance, certificate of | Under EPEA, a document that, for a specified time, relaxes or eliminates responsibilities contained in an approval or the regulations. A certificate of variance may be granted if three conditions are met:<br>▪ contravention of a term, condition, or requirement is beyond the control of the person who applied for the variance<br>▪ the variance is not likely to cause a significant adverse effect<br>▪ refusal to grant the certificate would result in serious economic hardship to the applicant without an offsetting benefit to others. |
| wastewater | Unwanted products or materials that are dissolved, suspended, or carried in water. |

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| wastewater sludge | A semi-solid residue, also known as bio-solids, that is a by-product of wastewater. |
| water | All water on or under the surface of the ground, whether in liquid or solid state. |
| water co-op | An organization formed by consumers of water to divert and distribute water for their mutual benefit. |
| watercourse | A natural channel through which water may run or does run. |
| water quality management area | Under the *Canada Water Act*, an area designated for restoring, maintaining, or improving the quality of water in rivers and other bodies of water. For waters outside of federal jurisdiction, a water quality area is only designated if water quality management planning is of urgent national concern and if there is an agreement with the directly affected province(s). No water quality management areas have been designated in Alberta. |
| water quality modeling | Analysis, usually computerized, that predicts possible changes in the quality of water in rivers or other bodies of water. |
| water quantity modeling | Analysis, usually computerized, that predicts possible changes in the flow and distribution of water in rivers or other bodies of water. |
| water right | A legal claim to water when the water is available. |
| watershed | An area of land that drains into a stream. |
| water well | As defined in EPEA and the *Water Act*, an opening in the ground, whether drilled or altered from its natural state, that is used for:<br>(i) the production of ground water for any purpose<br>(ii) obtaining data on ground water<br>(iii) recharging an underground formation from which ground water can be recovered and includes any related equipment, buildings, structures, and appurtenances. |
| weir | A structure in a water body over which water flows that serves to regulate water level or, in some cases, measure flow. |
| wetland | An area covered permanently, occasionally, or periodically by shallow water for a sufficient period to support aquatic life. This usually includes marshes, bogs, sloughs, fens, swamps, muskegs, and ponds, but not rivers or lakes. |

Among the functions performed by wetlands are provision of fish and wildlife habitat, attenuation of floods, and reduction of contaminants. The values provided by wetlands range from economic benefits to recreational opportunities to ecological protection.

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| wetland margins | The ordinarily dry land adjacent to a wetland (e.g., marsh, bog, slough, or pond) that depends on the presence of the wetland to provide water and habitat for plants and animals. |
| wet pond | Located at the end of a storm sewer trunk line, this storage area remains full of water. During a storm, the water in the pond rises above its normal level, allowing water to be retained for a sufficient time for downstream flooding to be reduced and water quality improvement to occur prior to the discharge of the stormwater to a stream or other water body. |
| White Area | The region of the province settled initially and includes nearly 40% of the total area of Alberta. Available public lands in this region may be applied for pursuant to the *Public Lands Act* if the land is:<br>▪ suitable for settlement or agriculture<br>▪ not required for purposes such as conservation, watershed protection, forestry, recreational uses, or wildlife habitat. |
| WID | Western Irrigation District |
| wilderness area | An area of land designated under the *Wilderness Areas, Ecological Reserves and Natural Areas Act* to retain its primeval character, with minimal facilities and management activities. Many human activities, particularly industrial, are prohibited in wilderness areas. |
| wildland park | A large area of land set aside by the provincial government to provide a natural landscape for wilderness recreation. Interference with natural processes is minimized. |

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